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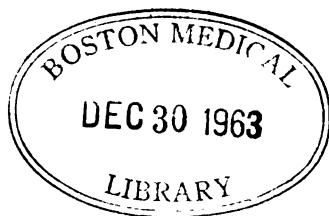
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**THE STANDARD
FAMILY PHYSICIAN**

VOLUME III



Alfred T. Schofield

THE STANDARD FAMILY PHYSICIAN

A Practical International Encyclopedia of
Medicine and Hygiene Especially
Adapted for the Household

EDITED BY

SIR JAMES SPEKHTON-BROWNE, M.D.,
F.R.S.

OF THE ROYAL COLLEGE OF PHYSICIANS

SIR WILLIAM H. BROADBENT, F.R.C.V.O.,
M.D., F.R.S.

LATE PHYSICIAN IN ORDINARY TO THE KING

ALFRED E. SCHOFIELD, M.D., F.R.C.S.E.

VICE-CHANCELLOR, BRITISH COLLEGE OF PHYSICIANS

AND CHIEF, NATIONAL MEDICAL
INSTITUTE FOR THE BLIND

PROFESSOR KARL REISSIG, M.D., F.R.C.

OF THE UNIVERSITY OF GIESSEN

AND

SMITH ELY JELF, M.D., F.R.C.P.

COLUMBIA UNIVERSITY, NEW YORK

With the Assistance of FRENCH, GERMAN AND AMERICAN
SPECIALISTS in the Treatment of Diseases and Experts in Medicine

OF THE

FUNK & WAGNALLS COMPANY

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SIR JAMES CRICHTON-BROWNE, M.D.,
LL.D., F.R.S.

LORD CHANCELLOR'S VISITOR IN LUNACY, LONDON

SIR WILLIAM H. BROADBENT, Bart., K.C.V.O.
M.D., F.R.S.

LATE PHYSICIAN-IN-ORDINARY TO THE KING AND PRINCE OF WALES

ALFRED T. SCHOFIELD, M.D., M.R.C.S.E.

VICE-PRESIDENT BRITISH COLLEGE OF PHYSICAL EDUCATION

VICE-PRESIDENT NATIONAL HEALTH SOCIETY

HON. PHYSICIAN FRIEDENHEIM HOSPITAL, LONDON

PROFESSOR KARL REISSIG, M.D., Etc.

HAMBURG, GERMANY

AND

SMITH ELY JELLIFFE, A.M., M.D., Ph.D.

COLUMBIA UNIVERSITY, NEW YORK, U.S.A.

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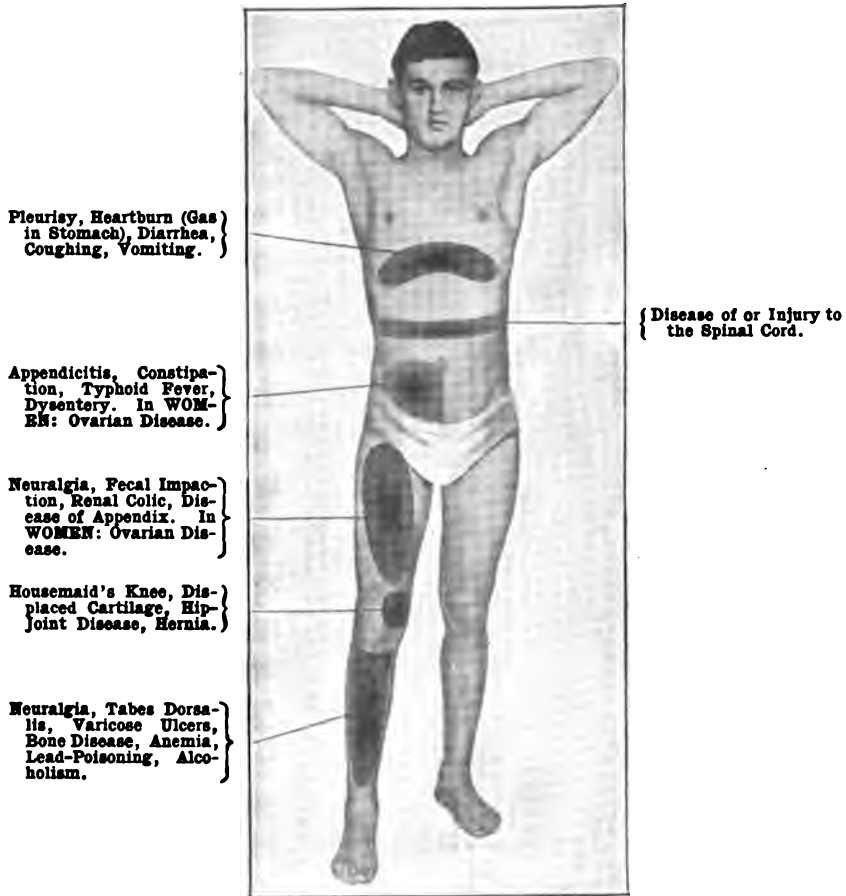


FIG. 330. LOCALIZATIONS OF PAIN

of the stomach, usually due to gas, gastric ulcer, and acute gastritis. More rarely the pain here is found to be due to diarrhea from inflammation of the large intestine, or it may be due to a large or inflamed spleen. Occasionally colicky pains due to the passage of a kidney-stone are reflected in this region; and inflammation in the calyx of the kidney (*pyelitis*) also causes pain at this place. Excessive exercise has been known to produce a very sore, tender feeling in the left hypochondrium; and aneurism of the aorta may likewise show its presence by pain in this region.

Pain at the navel itself is more frequently caused by ulcer of the stomach. It may also be reflected pain of gall-stones, and occasionally it is due to rupture. Not infrequently the pain of appendicitis locates itself immediately around the umbilicus at the beginning of an attack; but as a rule the pain of an inflamed appendix shifts from this position to occupy one on a line between the navel and the most prominent portion of the crest of the pelvis, the ilium. On this line three very important kinds of pain may be located, that of appendicitis being one of the most important. Ovarian disturbance is another, and more rarely we get impaction or intussusception as a third. When due to appendicitis, pains in this general region must necessarily occur on the right side, whereas ovarian pain may occur on either side. On the right side also, just below the free border of the ribs and to the right of the median line, one frequently finds an acute tender spot in disease of the gall-bladder (gall-stones). Further down in front, below the navel, one encounters, in the left iliac region, pains which are nearly always due to constipation with an excessive amount of gas or even with severe impaction. Pains in this region may be caused also by hernia, by inflammation of the ovary, and by diarrhea, especially of the large intestine. Pains in the groin, reaching from the hip down to the pubis, are apt to suggest the passing of a stone from the kidney; and a feeling of weakness and falling through at this point is very often associated with diarrhea. Menstrual pains are commonly felt here also. Hernia and diseases of the spermatic vessels may likewise give rise to pain in this region.

Pain directly over the pubis is most frequently due to cystitis or to menstruation; but other affections of the bladder and uterus, or ovarian disease, pelvic inflammation, and pregnancy may also give rise to pain in this locality.

Pain in the right hypochondrium, stretching from the umbilicus to the right nipple in front, is frequently associated with some form of liver disturbance, either functional or organic. Thus gall-stones, cirrhosis, syphilis of the liver, constriction of the liver due to tight lacing, abscess in the liver-substance or below the liver—all cause acute or dull pain in this region. Occasionally a movable kidney or the passing of a stone from the kidney may be reflected in this region by acute pain.

Colicky pains situated all over the abdominal wall in front are usually due to constipation and flatulence, and if associated with fever usually

portend peritonitis, and require very careful handling. This region, however, is one in which at least thirty or forty different affections may localize themselves. All give rise to different varieties of pain, so that it should be emphasized that severe pain in this region requires the attention of a physician in order to make a diagnosis. Such a diagnosis can only be arrived at after a very painstaking examination. If the pain or peculiar sensation suggests the pressure of a band about the abdomen, it usually either indicates a neuritis (herpes) or is a sign of disease of the spinal cord.

In the back, in this general region, one of the most frequent causes of pain is constipation. Diarrhea, uterine disturbances, and muscular involvement (lumbago) may also be responsible for such pain. Menstruation causes severe back-ache also. Some of the rarer diseases which cause pain in this region are tumor of the kidney, floating kidney, abscess of the kidney, inflammation of the bladder, and tumor of the abdomen. Further, it should be remembered that in all the acute febrile disturbances, particularly the infections, as tonsillitis, scarlet fever, measles, whooping-cough, and especially smallpox, pains in the small of the back are a very characteristic symptom. Why this is so is not known.

Occasionally ulcers of the stomach give rise to a tender spot to the left of the spine of the eleventh and twelfth dorsal vertebræ. Pains farther down in the sacral region are usually due to hemorrhoids, fissures of the anus, diseases of the ovary, uterus, and pelvis, or excessive sexual indulgence. Diseases of the hip-joint, and sciatica frequently occasion pains in this situation.

Pains up and down the spine are due to a number of causes; the painful spine of neurasthenia is classic. Meningitis causes pain, usually high up. Pott's disease, or tuberculosis of the spine, may give local pains at any point. Diseases of the stomach, liver, aorta, and kidney also produce pain up and down the spine; and a painful spine is a very characteristic accompaniment of certain infectious diseases, notably typhoid, smallpox, influenza, tonsillitis, etc.

Pain in the extremities of the body is usually due to neuralgia or to diseases of muscles or bones. In the joints themselves are located the local pains of acute articular rheumatism, usually associated with fever, heat and swelling; the pains of gout, usually associated with heat and swelling, but of a more local nature, involving fewer joints, particularly the larger joints of the foot; bone disease; tuberculosis in the joints; and that peculiar and unknown rheumatoid arthritis which gives rise to irregular deforming swellings in the joints, and is accompanied by severe and variable painful explosions.

Acute shooting pains in the arms, running up and down, are almost invariably neuralgic in nature, and may be brought on by exposure to cold, or by excessive exertion, too much work of one kind, such as typewriting,

telegraphy, sweeping, washing, etc. Shooting pains in the legs are usually of the same character (neuralgic), those in the back part of the leg being called sciatic. In young adults, men particularly, it should be remembered that severe neuralgic pains in the feet and lower legs, occurring in paroxysms, are very frequently early symptoms of disease of the spinal cord, and great care should be exercised by physicians in their diagnosis of this situation.

Pains in the thighs result from sciatica, but may also be due to troubles in the genito-urinary tract. They may be caused by cystitis, nephritis, and by abscess or swelling of the prostate. Affections of the rectum, especially cancer, are also accompanied by severe shooting pains down the thighs. Pains in the calves of the legs are usually of a neuralgic nature, and may be due to overexertion, to alcohol, or occasionally to deep-seated varicose veins. Diabetes gives rise to a peculiar form of neuralgia; and the possibility of hysteria should never be overlooked.

Pains in the foot are usually either gouty in nature, or more frequently due to flatfoot. Malposition of the bones of the foot is one of the most important causes of pain in this region. Such painful feet are very frequent among waiters, policemen, shop-girls, etc., who are compelled to stand on their feet for long periods.

PANCREAS.—For structure and functions, see **INTRODUCTORY CHAPTERS** (p. 58).

PANCREATIC DISEASES.—Affections of the pancreas may run their course without giving any external evidences of their presence. The symptoms associated with them can occur also with other diseases, and consist of fatty stools, salivation, vomiting, diarrhea, etc. Diseases of the pancreas, which are comparatively rare, may be present in connection with diabetes. They often persist for years without being recognized. At times they are extremely acute, and cause death very rapidly and mysteriously. The death of President McKinley was probably due to injury to the pancreas by the assassin's bullet.

PANCREATIC EXTRACTS.—The pancreas is a gland which secretes one of the most important digestive fluids. Its juice enters the intestine with the bile, just beneath the stomach, the two acting together on the food. In certain digestive disorders an extract of the pancreas of pigs is given to aid digestion, particularly when it is suspected that the pancreatic secretion is deficient. This extract, like the pancreatic juice, contains four ferments: *trypsin*, which digests nitrogenous foods (eggs, meat, etc.); *amyllopsin*, which converts starches into sugars; *steapsin*, which splits up fats; and a milk-curdling ferment. These ferments show a strong alkaline reaction, and so are usually given together with bicarbonate of soda. The extract is often used to predigest food before giving it to patients with very delicate stomachs, or food that is to be used in nutrient enemas. The dose is from two to twenty grains.

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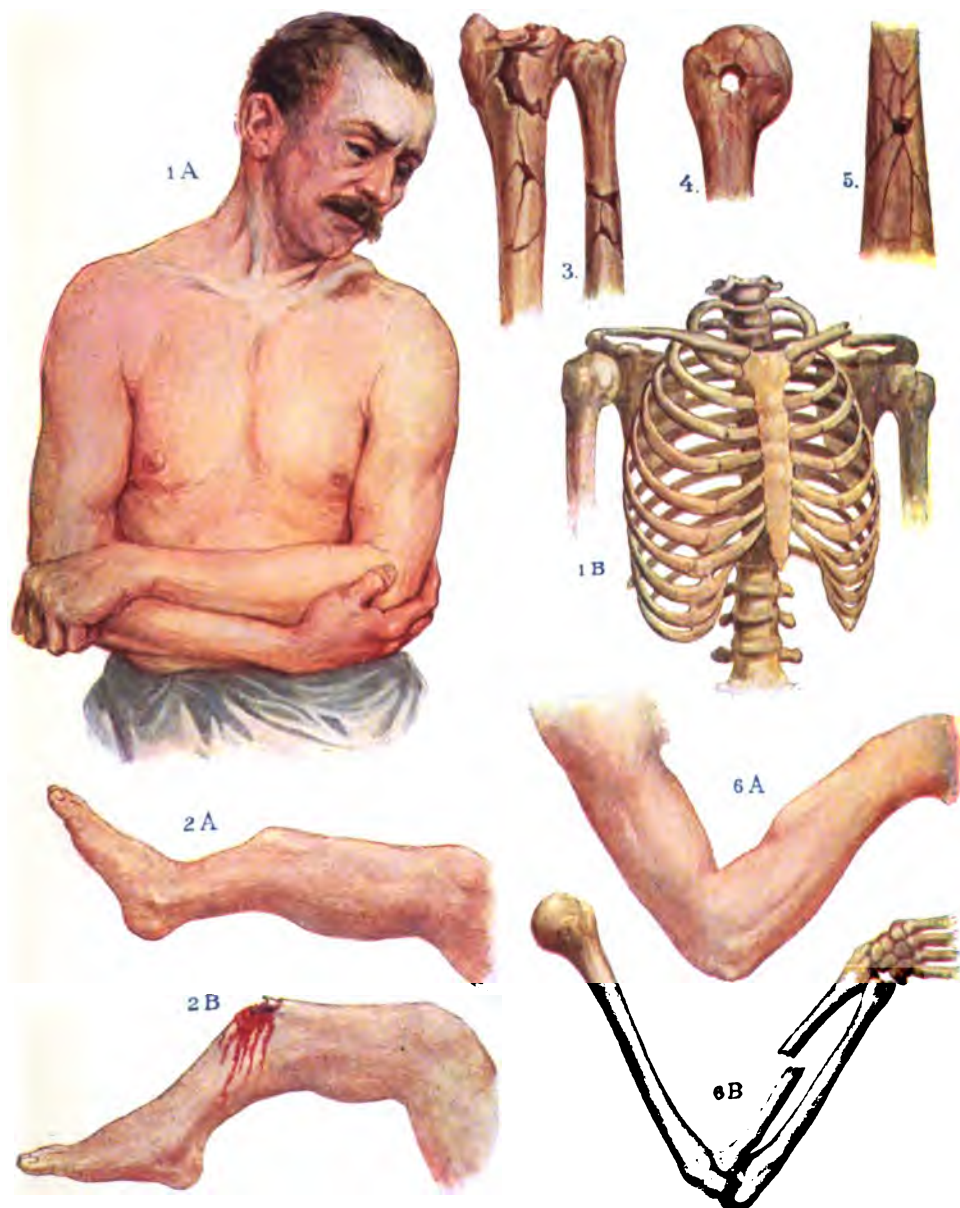
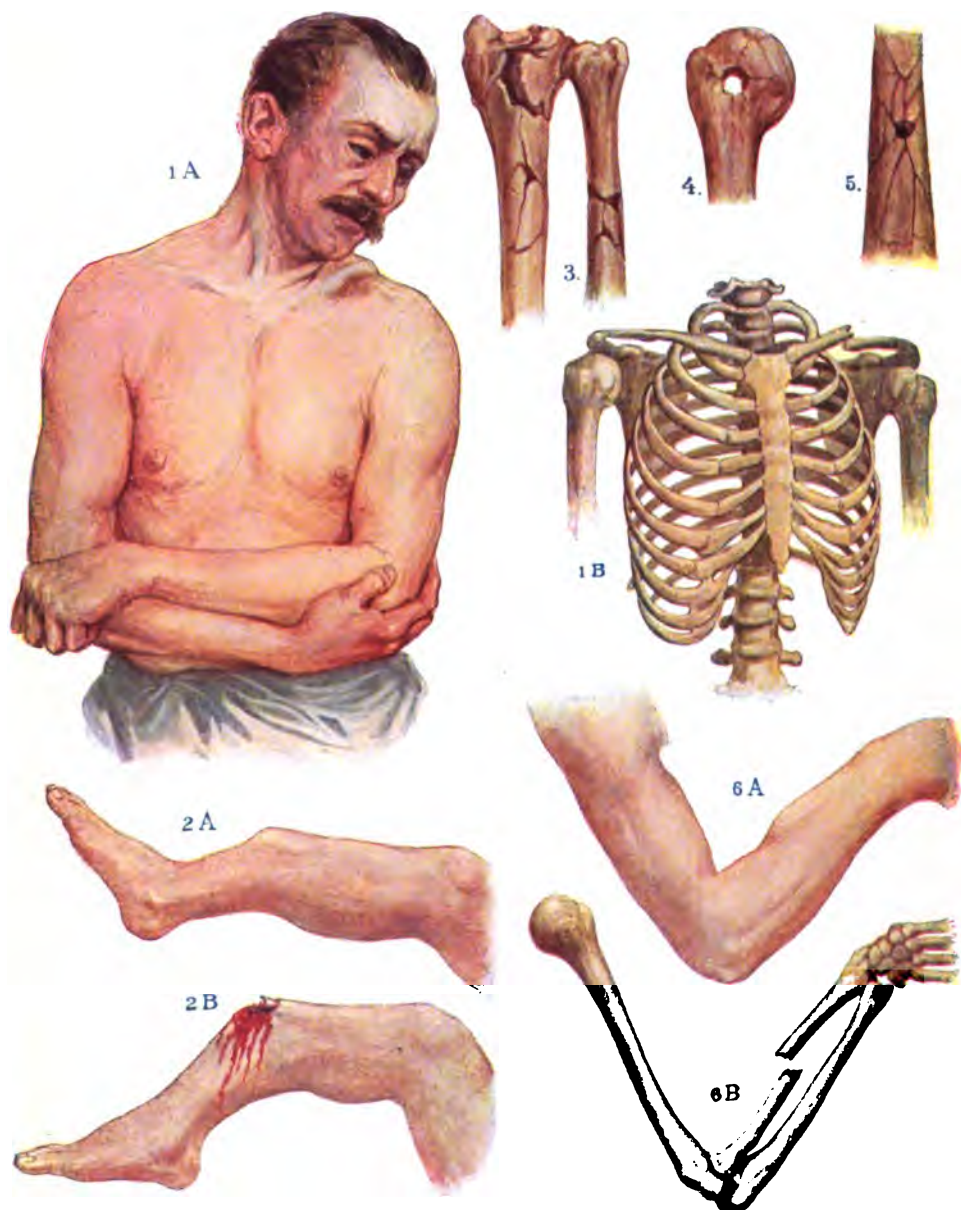


PLATE XVI. - BONE INJURIES

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| 1. <i>A.</i> Fracture of Left Clavicle | 4. Gunshot Injury; smooth Perforation |
| <i>B.</i> The same seen in the Skeleton | 5. Gunshot Injury with Splintering of the |
| 2. <i>A.</i> Simple Fracture | Bone |
| <i>B.</i> Compound, or open, Fracture | 6. <i>A.</i> Fracture of the Radius |
| 3. Bones Splintered by Machinery | <i>B.</i> The same seen in the Skeleton |



PAPOID.—A vegetable ferment obtained from the fruit of the tropical plant *Carica Papaya*, or papaw. Papoid will digest albuminous substances; and, unlike pepsin and the pancreatic ferments, it will act in an acid, alkaline, or neutral medium. It is used as a substitute for these enzymes, but is not as satisfactory as the animal ferments. It is sometimes used locally in diphtheria to dissolve the false membranes. The dose of papoid is about five grains.

PARALDEHYDE.—A colorless fluid with a strong, penetrating odor, and an unpleasant, burning taste. It is closely related to alcohol. Paraldehyde is given to produce sleep, and often acts very satisfactorily, but it is disagreeable to take, and sometimes upsets the stomach. It is given much diluted in water, or brandy and water, or in capsules. The dose is from twenty drops to a teaspoonful.

PARALYSIS.—Term generally indicating a loss of the power of contractility, either of a muscle or of a group of muscles. Paralysis of sensation, better termed *anesthesia*, may exist separately, or may occur in certain diseases in combination with paralysis of muscles. Muscle-paralysis may be due to affections of the brain or spinal cord, or to local diseases of nerves or muscles. Paralysis due to cerebral or spinal lesions are usually very severe, and are cured with difficulty. Nerve-injuries may be incurable, but many cases improve under skilful treatment. It is possible, by means of an electrical examination of the paralyzed muscles, to determine the possibility of recovery, and the probable time required for it. The electric current is capable of detecting what is known as the "reaction of degeneration"; that is, a sign of the complete loss of function of a nerve or a muscle. Some of the more important forms of paralysis shall be mentioned here.

Paralysis of the Hands and Fingers.—A form of paralysis involving the muscles of the hands and fingers is frequently brought about by pressure during sleep on the radial nerve, which extends on the thumb side of the arm. This causes the hand to dangle at the wrist, devoid of motility (see Fig. 331). Injury to the ulnar nerve (the nerve extending on the little-finger side) causes inability to flex the first finger-joints, and the hand gets the appearance of a claw (Fig. 332).

Paralysis of the Intestine.—This is a rare form of paralysis, and is characterized by inability to control the bowel movements, so that permanent intestinal sluggishness is present. If the ring-muscle (sphincter) closing the anus be paralyzed, the excrements may be discharged involuntarily.

Paralysis of the Diaphragm.—In this affection diaphragmatic breathing is rendered impossible, the patient being able to breathe only with the upper parts of the thorax. This condition is, therefore, attended with marked shortness of breath.

Paralysis of the muscles of one side of the body occurs in apoplexy (see BRAIN, APOPLEXY OF). For paralysis of the bladder and of the face, see

BLADDER, DISEASES OF; FACE, DISEASES OF. For paralysis of the muscles of the eye, see SQUINTING.

PARANOIA.—See INSANITY.

PARASITES.—Parasites are living plants or animals which live either temporarily or continuously on or in the bodies of other plants or animals and draw their nourishment from their host. It is noteworthy that there are hardly any plants or animals known which do not support some one or more varieties of parasites, and in the higher animals as well as in the more complex plants the number of these parasites may run into the hundreds. These parasites are responsible for the causation of many diseases in both the plant and the animal kingdoms, and when it is realized that practically all plant diseases, for instance, are due to some form of micro-



FIG. 331. Paralysis of the radial nerve.



FIG. 332. Paralysis of the ulnar nerve.

scopic parasite, one can appreciate the great importance that this subject has for the farmer. This is not the place, however, to discuss the subject of plant or animal parasites in their effects on plants, for only the discussion of parasites on man can be entered into. The parasites of the lower animals (dogs, cats, sheep, rats, cows, pigs, fish, turtles, snakes, frogs, spiders, etc.) occupy a very important place in the zoological system, but this again is outside the realm of the present article.

The parasites which are most inimical to man may be divided into two classes: plant parasites and animal parasites. Of the former, the bacteria and molds are most important; whereas among the latter certain minute protozoa, certain forms of insects, and certain worms are most commonly met with. In the chapter on BACTERIA full consideration has been given to the subject of plant parasites, and in the consideration of bacterial diseases such as typhoid fever, tuberculosis, meningitis, etc., what is known regarding the bacteria that cause them is fully discussed. As for the animal parasites,

the group of minute, one-celled organisms called *protozoa* are of extraordinary interest, since it has been shown only within comparatively recent times that they are responsible for certain diseases. This is probably true for malaria, possibly for yellow fever, undoubtedly for the disease known as the sleeping-sickness. These diseases are all due to the presence and growth of minute animals within the human body, these animals belonging to the lowest stages in the animal scale. It is well known, furthermore, that certain forms of dysentery and certain conditions such as abscess of the liver are due to minute protozoa, and it is not at all unlikely that certain forms of the infectious disease beriberi, certain skin diseases, and even possibly syphilis may be demonstrated as due to minute animal parasites.

More characteristic parasites, however, are certain forms of insects, which include mites as well as the true insects. The diseases that are due to insect parasites are not very numerous. Of the sixteen or nineteen systematic orders belonging to these forms, science recognizes about four as contributing to parasitic diseases of man: the flies, the fleas, the bugs, the lice, and the order to which the body-lice belong. Stinging insects are not here included. Two-winged insects are of interest in that very frequently they deposit their eggs in certain parts of the body. They are very rare; but the eggs of flies, etc., are known to occur as parasitic on the head and parts of the skin of people who are extremely unsanitary.

Flies, however, are of considerable interest when one bears in mind that they are often responsible for the spread of many diseases, particularly of infectious ophthalmia, where the flies, lighting on the eyes of an infected patient, transmit the infection to the eyes of a sleeping healthy person; and for the continuation of typhoid in camps where this disease is common.

The screw-worm or *Lucili macellaria* is a worm that occurs in the warmer portions of the United States, and is known to deposit its eggs in the nostrils of individuals when they are asleep, causing a very chronic catarrh of the nose. The jigger, or jigger-flea, is a native of the tropics. It is known to burrow into the skin, especially beneath the toe-nails, and there its eggs are laid, at times producing ulcers. It is one of the dreaded insects of the south. The best way to get rid of this parasite is by the introduction of a sharp knife-point, the object being to get the insect out without bursting the skin if possible, as this accident is apt not only to spread the eggs, but also to disseminate an acrid serum which forms foul ulcers.

The various fleas need only to be mentioned. While not as secretive as the bedbug, it may be said that the flea is by no means a harmless parasite, for it has within recent years been thought, with a fair degree of probability, to be one of the chief means of disseminating the plague, the flea of the rat being the most important transmitter. The dog flea is at home on both the dog and the cat, and is equally domiciled on the human individual.

The order of parasitic bugs is one of the most wide-spread and obnoxious. Its habits are nocturnal, as is well known. The animal does all its blood-sucking at night; and by reason of its flat body it is able to hide during the day in dark, flat cracks in furniture or carpentry. In some persons its bite is somewhat poisonous. The bedbug usually takes from seven to ten weeks to grow from the egg to the adult, and one can calculate on this time in efforts at eradication. The burning of sulfur and formaldehyde-gas in apartments with the idea of eliminating the bugs is largely a delusion and a snare. They must be vigorously attacked with kerosene or carbolic acid, and the warfare must be kept up unceasingly.

The different forms of lice are of much importance. The *Pediculus capitis* or head-louse, and the *Pediculus vestimenti*, or body-louse, are found very abundantly upon individuals of filthy habits, and may be transferred readily from them to people who have more careful modes of living. The method of attack is by means of thorough cleansing of the head, careful and incessant combing with a fine-tooth comb, and the use of alcoholic solutions of penetrating substances, such as kerosene, larkspur, etc.

The itch-mite is another insect parasite that deposits its eggs in the skin, usually in the soft parts between the bases of the fingers, where it leaves short lines showing the burrowing. The insect itself burrows beneath the skin, and if not promptly taken in hand may spread over a large part of the body, giving rise to ulcers and to very severe eczematous-like inflammations. Absolute cleanliness and the use of antiseptic salves are the remedies to be employed against the itch. It is usually wise to consult a physician with reference to the elimination of the burrows and the allaying of the irritation caused by the scratching.

For a discussion of parasitic worms, see the article on WORMS.

PAREGORIC.—A mild camphorated tincture of opium. It is used as a pain-allaying remedy in gastric and intestinal colics; and as a remedy for diarrhea. The dose for an adult is one or two teaspoonfuls; for an infant, from five to ten drops. In the cases of children, paregoric should not be used without a physician's directions; for although it contains only about one grain of opium to the tablespoonful, it is not well to accustom children to even such mild doses of this dangerous drug. It should never be used to produce sleep in children or adults.

PARESIS.—See BRAIN, SOFTENING OF.

PAROTID GLAND, INFLAMMATION OF.—See MUMPS.

PARTURITION.—The process of bringing forth a child. Childbirth usually takes place about 280 days after conception, and is accomplished by contractions of the womb, by the opening of the uterus, and by muscular pressure of the abdomen. The contractions of the womb, which are present during the entire period of pregnancy, become stronger toward the end, and lead to a loosening and gradual distention of the lower portion of the

womb. These so-called labor-pains widen the mouth of the womb, and force the presenting part of the fetus (usually the head) into it. As soon as the mouth of the womb (*cervix*) is fully dilated (that is, as soon as it will allow the passage of the head) the amniotic sac containing the waters usually ruptures, and the woman feels their discharge.

After the discharge of the waters the woman must be prepared for birth to take place at any time. In first pregnancies the rupture of the sac may take place too early, and a dry, tedious labor ensue. The rupture of the waters is a usual sign that the initial stage of childbirth is passed. Following this event, the labor-pains generally become more and more severe, and involuntarily the mother seeks to aid in the expulsion of the child by "bearing down." In her endeavor to do this she supports hands and feet firmly against the sides of the bed, drawing her breath deeply and at long intervals. This bearing down is usually a bad practise. It is true that it often aids in the birth of the child, but it is apt to rupture the vagina or other important parts.

As soon as the head of the fetus begins to exert pressure upon the intestine and the perineum, the patient feels a strong inclination to defecate. This inclination should not be gratified. Following the severe pains accompanying the pressure of the fetus, the child's head is forced into the cleft of the vulva, gradually distending the latter, and finally passing through the external opening and beyond the receding perineum. The head is followed by the shoulders of the child, and the remaining parts of the body slide out easily. The birth of the head is usually the most difficult part of the labor. In the passage of the head it frequently happens that the perineum (that part of the body situated between the vagina and the anus) is more or less torn. The narrower the vagina, and the more resistant the perineum, the more readily do these tears occur. Such ruptures should at once be sutured by the attending physician, in order to prevent infection which may result in inflammation or even in blood-poisoning. Furthermore, experience has taught that the loss of perineal support may cause the descent and prolapse of the internal genital organs. If the patient be sensible, and heeds the advice of her physician, it may often be possible to prevent such a tearing.

In case of premature birth, when the parturient is delivered without assistance, she should wait quietly until help arrives. She should place the infant between her thighs in such a manner that it is well covered, and able to breathe freely. Some time after the expulsion of the fetus the labor-pains recur, causing the expulsion of the afterbirth (the *placenta*). This is accompanied with a moderate hemorrhage. The placenta should be preserved, even after the ligature of the umbilical cord, so that the physician may determine whether the uterus is empty or not. It sometimes occurs that a child is born in an unopened decidua (born with a caul). In such

a case the caul should be opened at once, or otherwise the infant will suffocate. If the afterbirth does not follow spontaneously upon the expulsion of the child, and if no hemorrhage takes place, the patient should wait quietly. After about half an hour slight labor-pains recommence, gradually increasing in severity until the placenta is expelled. Pressure on the abdominal walls is sometimes practised in order to aid in the expulsion of the placenta. Even after the passage of the afterbirth, strong pressure on the uterus is helpful in preventing hemorrhage. The placenta and the decidua should be examined very minutely as to completeness, and pressure on the womb should be maintained for at least two hours after birth.

The patient herself, as well as her family, may do much in advance to assist in the normal course of childbirth and of the lying-in period. In a broader sense of the word, this preparation should begin before marriage. Some women are incapable of maturing the fetus, and others are unable to bring forth the viable fetus without endangering their lives. A careful examination by the family physician should, therefore, be made in due time. Among some of the conditions particularly prejudicial to health may be mentioned severe anemia, general weakness, consumption, sinister affections of the lungs, heart, or kidneys, tumors of the genital organs, and marked narrowing of the pelvis, caused either by a dwarfed growth or by rickets.

The dangers threatening a pregnant woman who suffers from any of these diseases may be obviated by exercising proper foresight, and by securing careful treatment after conception has taken place. In cases of moderate narrowing of the pelvis it is often advisable to induce artificial delivery as soon as the fetus is viable; that is, during the seventh or eighth month of pregnancy. In the absence of adverse conditions a chemical examination of the urine should be made from time to time, so that the physician may keep himself informed as to the functional capacity of the kidneys. In this way he will be able to detect severe disorders in these organs, and especially to avoid eclampsia, a convulsive, and often fatal, disease of parturient women.

The premonitory signs enabling a woman to recognize the oncoming of labor in time to call for assistance become manifest about ten days before the time of birth. One of the first signs is the falling or sinking of the womb, usually known as "regaining the figure." This is due to the settling down of the uterus and the pelvis preparatory to labor. In this later period the woman often experiences a slight change in disposition, a certain unrest, often of a cheerful nature. This may be followed by pressure and slight dragging in the small of the back and in both sides of the lower abdomen. A pregnant woman, especially one who is to deliver for the first time, usually experiences frequent inclinations to urinate during the last two weeks before delivery. She also experiences greater freedom of the abdominal region, and consequently of respiration. The fetal movements

also become less pronounced. At this time the presenting part of the fetus (usually the head) descends into the pelvis. These signs, however, as well as the calculation of the day of delivery, are often quite uncertain; and a pregnant woman should, therefore, observe certain precautionary measures during the last month of pregnancy. She should not leave the house unnecessarily, and should never be without a companion if she does. All objects required during the term of childbirth should be within easy reach. It has frequently happened that pregnant women have suffered severe injuries, even death, by falling from step-ladders or chairs which they had used in order to reach things that had been put on the upper shelves of closets. It is wise to engage one's doctor and nurse several months in advance.

The duration of the various stages of birth varies greatly in the individual cases. Owing to the firmness of the genital passages, they invariably last longer in women who are pregnant for the first time than in those who have had several deliveries. In first labors the initial stage lasts, on an average, ten to twenty hours, as against one to twelve hours in subsequent deliveries; and the expulsion stage from an hour and a half to eight hours, as against fifteen minutes to an hour and a half in subsequent cases. Disturbances of labor-pains may be incurred by exposure to drafts, by eating irritating or indigestible food, by the accumulation of excrements and gases in the bowels, and by distention of the bladder. In case of irregularity and feebleness of labor-pains, it is possible to regulate them by stimulating the activity of the skin (inducing sweating), by the application of hot towels to the abdomen, and by warm body-baths. Instead of baths moist packs may be used, especially in attacks of eclamptic convulsions.

If labor is seriously delayed it becomes necessary to determine the cause of the retardation; and if labor is going on without medical assistance it is imperative that a physician be summoned. As midwives are not regularly educated in the United States, it is advisable in all cases to have a physician in attendance. It is absolutely essential in every case of labor, whether it terminates without accident, or whether the physician is obliged to interfere, that every object and every person coming in contact with the parturient woman be absolutely clean and free from disease-germs. For details as to preventive preparations see PUERPERAL FEVER. A patient who has a narrow pelvis, or one who is conspicuously narrow-hipped, dwarfed, or deformed, should submit to an early physical examination. Even a woman who appears well built may have a narrow pelvis. This is particularly the case with women who have suffered from rickets during childhood. It is imperative, therefore, that women who have suffered from retardation of bone-development, or who have deformed limbs, or other abnormalities, should tell the physician of these defects, so that he may palpate and measure the pelvis to learn if it is large enough to permit the birth of a child. Severe interference with labor may be caused also by scars and tumors obstructing

the genital passages, and also by defective development, or excessive relaxation of the womb or of the abdominal walls. In patients with pendulous abdomens, which is generally present in a special form of narrow pelvis, the womb, with the fetus, falls so far forward that the child can not be made to enter the opening of the pelvis. In such cases it is feasible, by timely professional assistance, to bring about a correct position of the fetus.

The rupture of the amniotic sac occasionally takes place either too early or too late; that is, either before the complete distention of the mouth of the womb, or after the fetus has entered the vagina. In many cases the head does not present itself correctly in the pelvis until the sac has ruptured, so that a previous examination frequently gives no definite result. Too early rupture of the sac may cause an unfavorable change in labor. It may render the pains excessively severe and spasmodic; or it may cause the umbilical cord to prolapse, thereby placing the infant in certain danger of suffocation; or it may exert a harmful influence upon the position of the fetus. Early rupture is a frequent occurrence in faulty positions of the fetus, and in marked narrowing of the pelvis. Retarded rupture of the sac may delay delivery, or it may detach the entire placenta prematurely, thereby greatly endangering the lives of mother and child. Other disturbances of labor may be due to changes in the decidua, such as may be caused by dropsy of the ovum, low position of the placenta, and twisting of the navel-string around the neck of the fetus. All these accidents may be discovered by a careful examination during or before delivery, and grave dangers thus obviated.

The decidua sometimes causes disturbances during the third stage of labor. The inability of the womb to contract properly, furnishes another source of danger. The placenta may not be detached and expelled in due time, and dangerous hemorrhages are very liable to occur. Women suffering from chronic inflammation of the womb, and those having a flattened uterus, are especially liable to meet with this accident. In case of hemorrhage the parturient woman sinks back in a faint; her pulse becomes extremely weak, and she suffers from great thirst and air-hunger. The womb is usually relaxed, and an endeavor must be made to cause it to contract by vigorously massaging and squeezing the uterus. The patient should be warmly covered, and should be placed with head and shoulders slightly lowered. Stimulating beverages (coffee, wine, etc.) should be administered. In some cases it is advisable to place a sand-bag weighing from ten to twenty pounds across the abdomen in order to exert pressure upon the abdominal blood-vessels and on the bleeding uterus. The loss of blood may be temporarily compensated for by repeated injections into the rectum of a pint of a hot solution of salt, of the strength of one teaspoonful of salt to one quart of water. The temperature of this enema should be between 110° and 115° F.

PASTEURIZATION.—See NURSING, NOURISHING OF.

PEMPHIGUS (WATER-BLEBS).—A serious, often fatal, skin-disease, which is characterized by the eruption of watery vesicles on various parts of the body. It attacks very suddenly, and may occur in adults as well as in children. The disease begins with the appearance of red spots and blotches on the skin. These are followed by the formation of vesicles of various sizes; and sometimes a hundred or more of these blisters may be present at the same time. The vesicles contain a watery fluid, which is at first clear, but later cloudy; and in a few days they either dry without rupturing, or break, forming scabs which fall off after a time, leaving dark red spots. During this time new blisters are constantly appearing, running the same course. The surrounding skin, often a considerable area, is hot, red and inflamed. The eruption is accompanied by intense itching, pain, and fever; and these symptoms are aggravated by the formation of crusts, and the consequent scratching. The resulting sleeplessness and loss of appetite greatly reduce the patient's strength during the course of the illness, which may extend over several weeks or months. When the eruption subsides, recovery usually takes place very rapidly, but the disease is certain to recur after a longer or shorter interval. After several such recurrences, the patient may recover entirely; but if the attack be very malignant, the long-continued illness, together with possible complications, may bring about a fatal ending.

The cause of this eruption probably resides in some affection of the nervous system, and there is very little hope of preventing it. The medicinal treatment consists mainly of baths, the application of ointments, and the administration of remedies to alleviate pain and produce sleep. In addition to this, the patient may be made more comfortable by careful nursing, extreme cleanliness of his surroundings, and by applying cooling lotions to the affected parts. Above all, the patient must be prevented from scratching himself.

Pemphigus of infants is characterized by the eruption of a larger or smaller number of yellowish blisters, varying in size from that of a pea to that of a bean. These blisters, which resemble those caused by burns, usually appear on the head and trunk; seldom on the limbs. They are filled with a watery fluid which, at first clear, gradually becomes more thick and cloudy. The vesicles soon rupture, and in the course of a few days the skin dries up and falls off in scales, the site of each blister retaining a shiny appearance for some days. This disease may attack babies a few days after birth, and may occur also in older children. Slight fever is usually present at night. If the disease runs a protracted course, and the child becomes more and more restless and emaciated, medical assistance is requisite. The mild form of the affection requires strict cleanliness, moistening of the ruptured blisters with a boric-acid solution, and dusting with baby-powder.

A syphilitic form of pemphigus, which may be present already at birth, can readily be distinguished from the foregoing by the circumstance that the vesicles appear on the soles of the feet and on the palms of the hands. This affection calls for prompt medical interference.

· **PENNYROYAL.**—See **HEDEOMA.**

PEPO.—The seed of the *Cucurbita Pepo*, or common pumpkin. Its active principle is said to be a resin. Pepo is used in the form of an emulsion for tapeworm. It should be given in the morning, breakfast being withheld, and should be followed in a few hours by a cathartic. The dose is two ounces. It is harmless.

PEPPER.—The unripe fruit of the *Piper nigrum*, a vine growing in the East Indies. The three active principles of pepper are piperin, an irritating volatile oil, and a bitter resin. Pepper is principally used in certain forms of dyspepsia, when it is given together with some simple bitter. Externally it is sometimes employed as a counter-irritant.

PEPPERMINT.—The leaves and tops of the *Mentha piperita*, an European herb which has been naturalized in the United States. It has a characteristic odor and taste, and contains a volatile oil from which menthol is obtained. Peppermint is largely used for colic and flatulence, and as a flavoring substance. The oil of peppermint is a powerful local anesthetic, and is often applied over the site of a neuralgia or over rheumatic joints. It causes redness and burning, and should be removed when the burning gets too severe, being replaced by vaselin. If left on too long it will blister the skin. The oil is sometimes applied to an aching tooth. The dose of peppermint-water is one or two teaspoonfuls.

PEPSIN.—A ferment found in the gastric juice. Its chief function is to digest proteids, meat, eggs, or other albuminous foods. The pepsin used in medicine is derived from the stomach of the pig, and it usually contains a milk-curdling ferment, and some other substances. It will act only in the presence of acid, and should be capable of digesting three thousand times its own weight of albumen. Its use is indicated in cases in which the gastric secretion is deficient in pepsin; and it is usually given in combination with hydrochloric acid. Like pancreatin it is often used in the predigestion of foods. The liquor of pepsin and the essence of pepsin are given in doses of one or two teaspoonfuls.

PERICARDITIS AND HYDROPERICARDIUM.—The pericardium is a membranous bag which invests the heart. It consists of two layers, an inner, serous one which is firmly attached to the heart-muscle, and an outer, fibrous one which surrounds the heart as a wide pouch. Inflammation of the interior surface of this cavity causes either an accumulation of a larger or smaller quantity of fluid, or a coalescence of the heart with the pericardium. Both affections may give rise to severe disturbances of the cardiac activity. Inflammation of the pericardium (*pericarditis*) occurs in the

course of infectious diseases, such as scarlet fever, measles, typhoid fever, pneumonia, pulmonary tuberculosis, articular rheumatism, etc. *Hydro-pericardium* (dropsy of the heart) occurs as a part symptom of general dropsy in heart-defects, in chronic inflammations of the kidneys, etc. In addition to manifestations which are known to the physician only, there occur certain characteristic disturbances, which may lead to the discovery of the disease. In many cases this might otherwise be difficult, for the disease frequently runs an obscure course. At the very onset of the disease there may be present, in the region of the heart, pressing or darting pains which radiate into the left shoulder or into the upper arm. Oppression of the chest, a sensation of fear, impaired or accelerated respiration, palpitation of the heart, and irregular fever may be noted. It should not be overlooked that several of these symptoms are observed in many mild affections of the lungs or of the heart; but the continuance of the symptoms should cause the sick person to seek expert advice.

The duration and course of the disease depend upon the nature of the original affection, and upon the strength of the individual patient. Improvement usually sets in when the fever, pains, and oppressions diminish. Even after recovery, however, marked irritability of the heart, slight oppressions, and palpitation, may remain for some time. If the symptoms just outlined should occur before medical advice can be obtained, the patient should go to bed immediately and avoid even the slightest bodily exertion. To relieve the pain and anxiety, applications of cold water and ice to the region of the heart will be found very serviceable. The administration of alcoholic drinks in moderate doses is admissible only in case symptoms of cardiac weakness become manifest, or perhaps for habitual drinkers. Thirst, which is often tormenting, should not be quenched by an abundant administration of fluids, but by small pieces of ice and a little cold lemonade. While there is fever the diet should preferably consist of milk, soups, and eggs; whereas solid food is not to be given until convalescence has set in. It is of great importance to secure daily movements of the bowels by taking fruit-juices, stewed fruits, or mild purges; or, better still, by frequent enemas of oil or warm water. These directions should be strictly observed during convalescence as well.

PERIOSTITIS.—See BONE, INFLAMMATION OF.

PERITONITIS.—Inflammation of the peritoneum, the serous membrane which lines the abdominal cavity, and which also invests the abdominal organs. It is usually a very dangerous disease, often terminating fatally. Two main forms of peritonitis may be distinguished: the acute and the chronic. The inflammation usually proceeds from one of the abdominal organs covered by the peritoneum—stomach, liver, intestine, spleen, uterus, ovaries, etc. In most cases of acute peritonitis the focus of the disease is an ulcer or a suppurative process, which may have been

present for a longer or shorter period before involving the peritoneum. The chronic form usually, though not always, originates without the involvement of any abdominal organ.

Acute peritonitis is very frequently caused by the perforation of a gastric or an intestinal ulcer into the free abdominal cavity. Acute suppurative appendicitis is one of the most frequent causes of peritonitis. A sudden rupture of stomach or intestine, as the result of an injury, may likewise give rise to inflammation of the peritoneum; but this is a rather infrequent cause of the disease. An ulcer of the gastro-intestinal tract may exist for weeks, months, or years before perforation occurs. The depth to which the ulcerative process has penetrated is the important factor. After the mucous and muscular layers have been perforated, the base of the ulcer consists merely of the peritoneum which coats all the abdominal organs. The peritoneum then easily becomes inflamed, gradually grows thinner, and finally tears. The intestinal contents are rich in purulent bacteria, and readily give rise to inflammation when gaining access to the peritoneum. Inflammations of the female genitals, uterus, tubes and ovaries, are likewise apt to involve the surrounding peritoneum, the infectious material proceeding by way of the lymph-channels. Peritonitis may originate also from diseases of the liver and of the biliary passages. A purulent focus in any one of the abdominal organs is always liable to perforate into the peritoneal cavity. Inflammation of the peritoneum is likely to be followed by an accumulation of fluid in the free abdominal cavity, this fluid being at first watery and later purulent. This brings on a gradual distention of the abdomen, and results in more or less tension of its walls. The distention is also partly due to paralysis of the intestine, and the consequent accumulation of gases.

The general picture presented by peritonitis is usually one which may well cause anxiety. There is continued high fever, accelerated pulse, and nausea and vomiting; the abdomen is distended and tense as a drum, and sensitive to the slightest touch. The patient usually lies curled up in order to reduce the tension on the abdomen. The cardiac weakness brought about by the action of the toxins from the purulent process usually causes the disease to terminate fatally within two or three days.

When the inflammation of the peritoneum is not general, but limited to some definite portion, the outlook is more favorable. This may result in encapsulated collections of serous or purulent fluids, which often become shut off from the rest of the cavity by enclosing walls of thick connective tissue. These purulent foci can usually be emptied by an operative incision, and a complete cure obtained. This is fortunately often the case in the treatment of an abscess resulting from an inflammation of the vermiform appendix (see APPENDICITIS). If operative interference is delayed too long, however, the focus of pus is liable to rupture and to produce a general peritonitis which rapidly proves fatal.

The treatment of peritonitis consists of complete rest in bed, the application to the abdomen of an ice-bag which may be suspended from a frame as shown in Fig. 333, and keeping the intestines quiet by means of drugs. This method of treatment is often efficient when the inflammation is circumscribed, and particularly if no pus be present.

Chronic peritonitis pursues a course unaccompanied by the stormy symptoms characteristic of the acute attack. This type is usually due to tuberculosis of the peritoneum, and is mainly marked by **ASCITES**, a condition in which the abdomen is distended by a watery fluid. A physician alone can diagnose this disease, which is especially frequent in children. It may be present as a complication of general tuberculosis of the intestines



FIG. 333. Ice-bag suspended over the abdomen.

or of the lungs, or as a premonitory sign of this disease. A spontaneous cure is rare in these cases. The internal administration of creosote and cod-liver oil may aid in conjunction with proper nourishment, principally milk and eggs. Abdominal incisions with various remedies are to be undertaken only on the advice of the attending physician. The most certain means of obtaining a cure is by means of laparotomy, an operation consisting in opening the abdomen by incision in the loin.

Finally, there is another form of chronic peritonitis, which is not accompanied by the accumulation of fluid in the abdominal cavity, but in which there are formed more or less dense bands of connective tissue, bringing about adhesions between the various organs in the cavity. This type, which may involve some or all of the abdominal organs, may run its course with few or no definite symptoms. In other cases, however, the patients suffer more or less constant abdominal pain and digestive disturbances, or

there may be attacks of severe pain recurring at long intervals. The condition may at times be cured by opening the abdomen and breaking up these adhesions.

PERMANGANATE OF POTASSIUM.—A salt of manganese and potassium, occurring in slender purple crystals. It is easily soluble in water to which it gives a purplish color even in very dilute solutions. It has no odor, but has a sweet, disagreeable taste. Solutions of potassium permanganate are more or less antiseptic, the salt giving up part of its oxygen which combines with the bacteria and destroys them. The oxygen also combines with putrefactive materials, and acts as a deodorizer. It is used as an antiseptic wash for wounds and ulcers, and in certain diseases of the nose and ear. It is commonly used as an injection in some stages of gonorrhea. Permanganate of potassium is said to be an effective antidote to snake-bite, if injected around the wound before the poison is absorbed. It has been used also in cases of opium-poisoning. The stomach is washed out with a solution of the salt, and frequent doses of it are given for several hours. Surgeons often use it for disinfecting their hands before operating.

PEROXID OF HYDROGEN.—A watery solution of hydrogen dioxide. It is a colorless liquid with a slightly acid taste. When applied to a mucous membrane, it produces a peculiar froth, which is due to coagulation of albumin. It is used as a deodorant and as an antiseptic, especially in inflammations of mucous membranes. The use of peroxid for bleaching dark hair is well known.

PERSPIRATION.—The excretion of fluid by the sweat-glands of the skin (see p. 20). Under ordinary conditions the amount of sweat excreted, although quite considerable, does not form visible drops, since it evaporates as rapidly as it forms. In very warm weather, however, the quantity becomes greatly increased, and accumulates in beads on the surface of the skin. The feet and the armpits are plentifully supplied with sweat-glands, and excessive perspiration in these parts is very common. The sweat serves as a means of regulating the body-heat, and also to carry off certain waste-products of metabolism.

In certain diseases, principally of the kidneys, the amount of sweat excreted may be considerably lessened; while other diseases, such as various febrile affections, cause increased perspiration. When sweat is allowed to accumulate on any part of the body, it will decompose and give rise to a very offensive odor. This is especially noticeable in perspiring feet. Offensive perspiration may occur also in certain diseases, notably in rheumatic affections. In some catarrhal and febrile affections, it is often desirable to increase perspiration, and certain remedies (*sudorifics*) are employed for this purpose (see DOMESTIC REMEDIES; MEDICINES). With regard to the treatment of excessive or ill-smelling perspiration, cleanliness is the all-important remedy. See SKIN, CARE OF.

PERUVIAN BARK.—See CINCHONA.

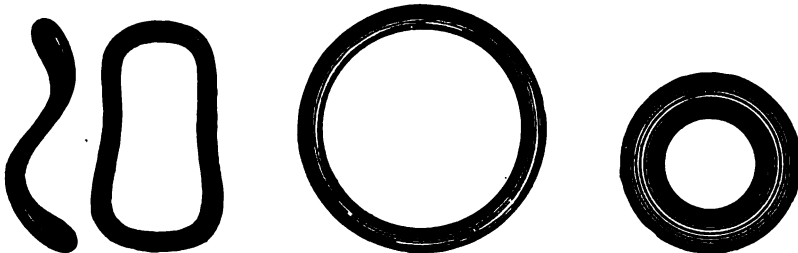
PES EQUINUS (literally, **HORSE-FOOT**).—A common deformity of the foot, in which its anterior portion is depressed to a lesser or greater degree, so that the heel does not touch the ground in walking. In severe cases the foot may be turned down to such an extent that the back of the foot lies in the same direction as the lower leg (see Fig. 334). The deformity is caused by paralysis of the muscles of the leg, and is frequently an accompaniment of clubfoot. It is of importance to know that the condition often appears in patients suffering from contagious febrile diseases, as typhoid, scarlet fever, etc. Cases of developed pes equinus are treated with splints, plaster of Paris bandages, or by tenotomy, an operation consisting in cutting the tendon.



FIG. 334. Pes Equinus.

PESSARY.—An instrument placed in the vagina to support the uterus. Pessaries are made from hard rubber, celluloid, bone, or metal, and are of various shapes. It is important to remember that they are not hygienic instruments unless the vagina is kept scrupulously clean. This may be accomplished, in part at least, by frequent douching under the directions of a physician. Figs. 335-337 show some of the more common forms of pessaries.

PHARYNGITIS.—Catarrhal inflammation of the pharynx (see pp. 49, 55). This disease, which is one of the most frequent affections of man,



FIGS. 335-337. Various forms of pessaries.

may be either acute or chronic. The acute form is usually associated with running from the nose, and often involves the larynx and the bronchi, causing hoarseness and cough. In acute pharyngitis all the mucous mem-

branes of the mouth and of the pharynx are congested and inflamed. The symptoms include a sensation of dryness, irritation in the throat, pain on swallowing, and stitches in the ears; the voice readily tires. The disturbances are increased by eating spicy foods, by drinking alcoholic beverages, by inhaling smoke or dust, by staying in crowded or overheated rooms, and by prolonged singing or talking. Iced drinks, such as lemonade, act beneficially.

Acute pharyngitis is usually caused by a cold in the head (see CORYZA), or by local irritation due to the inhalation of dust, smoke, chemical vapors, etc. Exaggerated singing or shouting may also be a factor. By observing a proper diet, and by avoiding the harmful influences already enumerated, the acute catarrh usually passes off spontaneously in from two to eight days.

Frequent recurrences of acute attacks may gradually lead to a chronic catarrh of the pharynx. The latter condition, however, may result also from other causes. The primary cause of chronic pharyngitis should usually be looked for in the nose. Obstruction of the nasal passages causes the patient to breathe through the mouth, especially at night. This causes the mucous membrane of the pharynx to become dry and irritated, so that it gradually becomes the site of permanent inflammatory changes. Constant flow of mucus from the posterior nares, which communicate with the pharynx, likewise irritate the mucous membrane of that organ, leading to congestion, proliferations, and inflammation. Among persons who are especially exposed to chronic pharyngitis may be mentioned hatmakers, employees in cement factories and chemical works, spinners, and persons who drink or smoke to excess. Singers, teachers, and preachers are also in constant danger of being attacked by this affection.

Chronic pharyngitis is characterized by dryness of the throat, alternating with mucous obstruction, by irritation which causes hawking and coughing, by huskiness of the voice, and by temporary sensations as of a fish-bone or other foreign body being lodged in the throat. Long-continued vocal exertions cause the voice to become tired and strained, and may even render talking painful. The clearness of the voice is impaired by frequent accumulations of mucus, especially on the first attempt to speak or to sing. The mucous obstruction is greatest in the morning, and efforts to clear the throat are often accompanied by retching or even by vomiting. It is sometimes impossible for such patients to brush the teeth or to rinse the mouth without getting an inclination to vomit.

Since the cause and continuance of chronic pharyngitis are incident to the patient's mode of living, or to his occupation, a permanent cure can not be expected without a change in these conditions. Pharyngitis does not constitute a menace to health, quack literature to the contrary notwithstanding. It does not lead to tuberculosis. Chronic pharyngitis may extend to

the Eustachian tubes, leading to disturbances of hearing. It sometimes causes thickening of the vocal cords, thereby giving rise to permanent hoarseness. The irritation of the pharynx often causes the patient to make swallowing movements. In this way a considerable quantity of air may be swallowed, giving rise to a distention of the stomach, which may simulate an affection of that organ or of the heart. The frequent swallowing of saliva may cause vomiting, and loss of appetite. The cure of chronic pharyngitis depends upon avoidance of all harmful influences, upon local treatment by a physician, and upon the use of waters from warm saline springs or from cold sulfur springs.

PHENACETIN.—A derivative of coal-tar, resembling acetanilid, and occurring in white crystals devoid of taste and odor. Phenacetin is efficacious in reducing fever, and was at one time largely used for this purpose. It has been found to be too depressing, however, and has been replaced by other remedies. Its use is chiefly indicated in the treatment for pain of a neuralgic nature, over which it has a remarkable control. Patients vary greatly in their susceptibility to this drug. Some can take large doses, while others experience unpleasant symptoms after a comparatively small dose. Phenacetin may cause blueness of the skin, some shortness of breath, and quickened pulse. Various skin eruptions have occurred from its use; and after a very large dose the patient may go into a state of collapse. In such a case the stomach should be emptied, external heat applied, and stimulants given. Long-continued use of the drug may cause indigestion, tremor, irritability, and depression. The dose of phenacetin is from one to five grains. See also ANALGESICS.

PHOSPHORUS-POISONING.—A very dangerous form of poisoning which may be brought about by the intentional or accidental swallowing of the material used on the tips of matches, or of phosphorus paste used as rat-poison. Without prompt medical aid this almost certainly leads to death within a few days. The symptoms, which are sometimes delayed six or eight hours, begin with pain and burning in the stomach. Eructation, retching, and vomiting then set in. The vomitus usually smells of phosphorus, and is frequently luminous in the dark. The stools may likewise be phosphorescent. At a later stage there may be pain in the region of the liver, the white of the eyes may turn yellow, and jaundice of the face and of the entire body may become manifest. The symptoms usually recede on the second or third day, so that it may appear as if the patient were about to recover. In fact, a few patients do recover; but in the greater number of cases the early symptoms recur. Violent headache, and extravasations of blood under the skin develop, and the patient dies jaundiced, and in deep coma. The most important part of the treatment is to empty the stomach, and to administer copious quantities of ice-water and of iced mucilage or starch-paste. Fats, oil, milk, and the yolk of eggs should not

be used as antidotes, as they aid in the absorption of phosphorus. The physician must be called immediately.

Individuals working in match factories are often affected by chronic phosphorus-poisoning which manifests itself especially by pains, loss of the teeth, and inflammation and gangrene of the jaw-bones. See **OCCUPATION DISEASES**.

PHTHISIS.—See **TUBERCULOSIS OF THE LUNGS**.

PHYSOSTIGMA (CALABAR BEAN).—The fruit of *Physostigma venenosum*, a woody creeper growing in Calabar, on the west coast of Africa. It is known also as the ordeal-bean, having been used for years by the natives as a test for witchcraft. The seed contains three alkaloids, *eserin* or physostigmin, *calabarin*, and *eseridin*, *eserin* being the most powerful. It is a stimulant to involuntary muscles, such as are found in the blood-vessels, stomach and intestines, uterus, bladder, etc. It depresses the spinal cord and, in large doses, the peripheral nerves. Taken internally physostigma causes contraction of the pupil, on account of which it is used in the treatment of ulcers on certain parts of the eye, and in other eye affections. It is used also as a stimulant to the intestine and bladder, and in certain lung affections. The symptoms of poisoning consist of muscular tremor followed by relaxation, contracted pupils, slow, irregular breathing, and weak pulse. Treatment consists in emptying the stomach, in administering atropin as an antidote, and in stimulating the patient. The dose of *eserin* sulfate is $\frac{1}{80}$ of a grain.

PIANISTS' CRAMP.—A form of occupation neurosis which occurs almost exclusively in professional pianists, and most frequently in young, weakly girl pupils of the conservatories. It is characterized by pains in the arms, and by a sensation of fatigue, which compel the pianist to stop playing soon after having begun. Actual spasms may develop. The treatment of the affection requires suspension of playing. At the same time massage and gymnastic exercises may be employed, depending largely upon the severity of the affection. After recovery has taken place it is important to take sufficient rest between the times of practising, and to refrain for some time from playing pieces that require wide stretching of the fingers.

PILES.—See **HEMORRHOIDS**.

PILOCARPUS.—The leaves of several varieties of *Pilocarpus*, a tree growing in South America. It depends for its action on two alkaloids, *pilocarpin* and *isopilocarpin*. Physiologically it acts much like muscarin, but is not as poisonous. The most noticeable effect of pilocarpus or its alkaloids is an increase in the amount of sweat secreted. It also contracts the pupil of the eye, depresses the circulation and temperature, and slightly stimulates the kidneys. The most common use of pilocarpus is to produce free sweating when it is desired to reduce the amount of fluid in the system,

as in dropsy or accumulations of fluid in any of the body cavities. Like physostigma it is used in certain eye conditions to contract the pupil. Its free use is limited by its depressing effect. Poisoning by pilocarpus causes an increased secretion of sweat, saliva, and tears. There may be nausea and vomiting. The pupil is contracted, the breathing quick and difficult, and the pulse either fast or slow and irregular. Atropin is the antidote for poisoning by pilocarpus, and, conversely, pilocarpin is given for atropin-poisoning. The preparation most frequently used is pilocarpin or some one of its salts, the dose being $\frac{1}{8}$ of a grain.

PIMPLES.—See SKIN BLOTCHES.

PINE-NEEDLE BATH.—Bath prepared by adding an extract of pine-needles (4 to 16 ounces of pine-needles to 1 or 2 quarts of hot water) to a full body bath. Instead of this, 15 to 20 drops of pine-oil may be added to the bath, or a decoction of fresh fir- and pine-twigs may be used. The oil irritates the skin more than does the extract, and is not well endured by persons with sensitive skin. The temperature of the bath should be about 95° F., and its duration from 10 to 30 minutes.

PINWORMS.—See WORMS.

PLAGUE.—In the days of antiquity, and during the middle ages, the word "plague" was used as a designation for many malignant diseases occurring in epidemics. Within more recent years, however, the term has been used solely to designate one certain malady, namely the *bubonic plague*. This is a very acute, contagious disease, and is characterized by a severe general infection, accompanied with high fever and, in the majority of cases, with inflammation of the lymph-glands of the groins, the arms, or the neck. It is usually rapidly fatal. Endemic in certain parts of the interior of Asia and Africa, the disease occasionally spreads from its permanent homes, involving smaller or larger portions of the population of the globe. The "emerods (or tumors) in their secret parts," mentioned in I. Sam. v. 9, were undoubtedly the results of plague in Canaan. The first epidemic more exactly known historically was the pandemic which, during the sixth century, spread over almost the entire Europe. It is usually referred to as the "Justinian Plague," as it occurred during the reign of Emperor Justinian.

The most terrible pandemic of the subsequent centuries was the "Black Death" which invaded Europe in 1348, and from which it has been estimated that no less than 25,000,000 human beings perished. This epidemic was transmitted to Europe from China, Constantinople being the first point infected. Thence the plague traveled westward in a circle, reaching Russia three years later. Some cities and countries lost one-half their populations; and ships manned by dead crews drifted aimlessly about on the high seas, the putrid corpses scattered on their decks carrying contagion to the lands to which wind and tide chose to bear the vessels. At least 41 epidemics are

known to have occurred since then. In 1896 an epidemic broke out in Bombay, which is still threatening the world.

The cause of plague is a micro-organism which usually enters the body of man through small wounds of the skin. The disease is spread by human intercourse, and also by animals, especially by rats. These animals may also be affected by plague. In fact, it is possible that the malady is, originally, a disease of rats or of other rodents. Unfavorable hygienic conditions, such as dark, musty, and dirty dwellings, overcrowding, misery, and famine, are important factors in developing and disseminating the disease.

The most frequent type of bubonic plague is characterized by swellings of lymph-glands in various parts of the body, most frequently in the groins and armpits, more rarely on the neck. These swellings, which have given the malady its name, are more or less extensive and painful. They often break down and suppurate. In many patients the disease runs so rapid a course that the glandular swellings have little time to develop. The bacteria causing the disease enter the blood, and the patient dies under symptoms of severe blood-poisoning. In the so-called "pneumonic" form of plague, the infection is located chiefly in the lungs, where it causes an inflammation which is characterized chiefly by the coughing of bloody sputum, marked shortness of breath, and high fever.

Measures to prevent the disease consist primarily in the speedy isolation of affected persons, and strict surveillance of suspected individuals. These safeguards must be combined with extensive disinfection, including all objects used by patients, their excreta (sputum, urine, and feces), the sick-room, and the infected houses. It is also of great importance to institute campaigns of extermination against rats, in houses as well as on shipboard; to prohibit the gathering of throngs; to supervise traffic, by water as well as by land; and to aim at improving general sanitary conditions. For the individual person, the most scrupulous cleanliness is imperative.

PLASTERS.—See DOMESTIC REMEDIES.

PLEURA.—For anatomy and physiology, see INTRODUCTORY CHAPTERS (p. 53).

PLEURAL CAVITY, DISEASES OF.—In addition to diseases of inflammatory origin, a number of other affections may occur in the thoracic cavity. In general dropsy, especially when due to heart- or kidney-disease, fluid collects also in this cavity, usually on both sides. Effusions of blood are most frequently the result of injury; in rarer instances they are due to the rupture of an **ANEURISM**. This condition must be carefully distinguished from the hemorrhagic forms of pleurisy, which are almost invariably due to the presence of a tuberculous process. Accumulations of air and gas in the thoracic cavity are due either to the entrance of air from without through an injury to the chest-wall, or to the rupture of a pulmonary abscess which permits air to enter from the lung. The latter condition, in which

also pus finds its way into the cavity, is usually connected with some tuberculous process, less often with pulmonary gangrene. The presence of air in the chest-cavity always produces considerable embarrassment of respiration, and is a most unfavorable complication, especially when considered in connection with the severe character of the original disease. Neoplasms, or tumors, in the pleural cavity are comparatively rare. They are either derived from the lung, or from bits of tumors which have been transported thither by the circulation. This refers chiefly to cancer nodules.

PLEURISY.—Inflammation of the pleura, the serous membrane investing the lungs. This is one of the most frequent of human ailments, but rarely exists as a disease of itself, resulting in these rare instances from an injury to the thorax, or from a cold. As a rule pleurisy is the immediate consequence of inflammatory processes in the neighboring organs, such as pneumonia, pulmonary gangrene, tuberculosis of the lungs or of the lymphatic glands situated at the root of the lungs, and inflammation of the endocardium or of the peritoneum. It may develop also from pathogenic agencies which reach the pleura through the circulation, in such diseases as blood-poisoning, purulent inflammations of joints, gout, or kidney troubles.

There are two varieties of pleurisy, the *dry* and the *moist*. The disease invariably begins with a congestion in the blood-vessels of the pleura. This is followed by the exudation of fibrin, which is deposited on the pleura in the form of fine bands or as thick irregular masses, often resulting in adhesions between that part of the pleura which covers the lung and that which is reflected over the ribs. This constitutes dry pleurisy. In addition to the deposit of fibrin, there may be a copious exudation of blood-serum into the pleural cavity. Sooner or later this fluid may become purulent, and in rare cases there may be present in the pleural cavity an admixture of blood, or pure blood, constituting the moist form of the disease.

The onset of pleurisy may be marked by a sudden chill; but in most instances the disease develops very gradually. The patient usually complains of a pain in the side, which is rendered worse by movements of the body, by yawning, coughing, or other exertions. To this is added shortness of breath, and a constant desire to cough. The patients lose their color, they feel fatigued, and the appetite is diminished. The severer cases of pleurisy are accompanied by fever, but this rarely reaches a high point. If effusion into the pleural cavity occurs, the urine becomes dark in color, lessened in amount, and contains a sediment. As the exudation is absorbed, the amount of urine again increases, and may be as much as 2 to 3 quarts daily.

There remains to be considered very briefly some of the distinguishing characteristics of the various forms of pleurisy. The ordinary mild cases of dry pleurisy run their course without causing much disturbance or producing any marked symptoms. Even where exudation is present, robust persons may go about their business for several weeks; and only when the

symptoms become increasingly distressing do they take to their beds. When an abundance of fluid is present in the pleural cavity, the lung gradually becomes converted into a flattened, almost airless mass of tissue, which is pressed against the vertebral column. The heart is displaced to one side; and the liver, stomach, and large intestine are pressed downward. In favorable cases the fluid is entirely absorbed, and a complete cure results. In severe cases the pleura is thickened, and the chest-wall may be drawn in as the result of scarry contractions of the pleural membrane (see Plate XVII., Fig. 4).

Suppurative pleurisy, or empyema, results in high, irregular temperature and is accompanied by severe general symptoms, the prostration and loss of strength being particularly marked. If the pus be not evacuated by operative means, it is liable to rupture externally through the chest-wall, either into the lung or into the abdominal cavity.

Every case of pleurisy must be looked upon as a serious disease, because even the restricted and apparently harmless inflammation may grow rapidly worse if not properly attended to. As a rule the severity of the case depends to a large extent on the underlying disease.

If a person be seized with a sudden pain in the side of the chest, has difficulty in breathing, and is oppressed by a sense of thoracic pressure, it is best to call a physician at once. If the pain be very distressing, temporary relief may be obtained by applying mustard-plasters or warm poultices. It is not advisable to resort to measures for inducing perspiration, or to give any remedies tending to increase the amount of urine in order to hasten the absorption of the fluid in the pleural cavity; for it is very essential that the action of the heart be carefully watched under these circumstances. Medical supervision is also necessary to determine the variety of the disease, and to detect the possible formation of pus. In the case of suppuration, the patient's life very often depends on timely operation, by which a free drainage for the pus is provided. If retraction of the chest-wall result after the inflammatory process has healed, a more or less complete expansion may often be gained by the systematic use of the respiratory exercises described under GYMNASTICS. This is apt to be less successful in those severe deformities of the chest which often result in patients treated by so-called "natural methods" (diaphoretic treatment; water-cures; etc.), which fail to provide for any evacuation of the fluid accumulated in the thoracic cavity. It is also essential that the patient take very good care of himself during the period of convalescence. His food should be ample and strengthening, and he should spend a great deal of time in the open air. If his means allow it, it is well to go for a time to some suitable resort, either in a mountain-region, or by the seashore.

PLICA POLONICA.—See ELF-LOCK.

PNEUMONIA.—See LUNGS, DISEASES OF.

PODOPHYLLUM.—The root of the May-apple, or *Podophyllum peltatum*, a herb growing extensively in light woods in the United States. It contains a resin of somewhat variable composition, the action of which depends on the presence of the more powerful substances *podophyllotoxin* and *picropodophyllin*. Podophyllum is a slow but reliable cathartic, which directly stimulates the intestines, and increases the flow of bile. It is usually given in combination with other drugs. An overdose irritates the bowel, and causes violent purging, blood and mucus being passed in severe cases. The dose of the resin is from $\frac{1}{12}$ to $\frac{1}{2}$ a grain, according to whether a cathartic or a purgative action is desired.

POISONING.—In medical science the knowledge of poisons is known as *toxicology*. Accurately to define what a poison is, is no simple matter from the medical point of view. Legally it must be restricted for purposes of convenience. But as the laws of the different states are very far from being in accord with reference to the definition of what a poison is, it would perhaps be of little moment to attempt to define it here legally.

Medically the difference between poisons and non-poisons, as such, does not exist. Poisonous properties depend so largely upon the factor of amount, that one must consider the word in its adjective sense alone. Many substances, when taken in small amounts, are perfectly harmless, and may even be said to be beneficial to the body; whereas, taken in large quantities they are counted as poisonous substances, and the line of transition between purely beneficial, indifferent, or poisonous substances is difficult to ascertain. Thus, it is well known that arsenic is a useful substance when taken in small quantities. It improves the appetite, increases the number of blood-cells, and is an indispensable remedy in certain diseased conditions; yet excess of arsenic results in destruction and death of tissues. The same may be said of a vast number of substances, and may even be extended to include the use of water.

Thus a poison may be defined as a substance which, when taken into the body, is capable of influencing the molecular characters of the organ or organs so that the function of the organ or organs involved is materially altered from the normal. Such alterations from the normal may go on to death, or they may go on simply to toxic action and recovery. This, as has already been stated, depends largely on the individual, on the organ acted upon, and on the dose. Problems of absorption and resorption and of elimination are all subjects of investigation by the toxicologist, and do not involve the layman.

Poisons have been classified, from the more general point of view, purely according to the kind of changes that they bring about in the living protoplasm; and some toxicologists have defined all poisons as being (1) *oxidizing poisons*, such as oxygen, hydrogen peroxid, phosphorus, arsenic, permanganate of potassium, etc.; (2) *catalytic poisons*, such as the anesthetics:

ether, chloroform, alcohol, etc.; (3) a group which acts by forming salts with the protoplasm of the body-cells, such as the mineral acids, solutions with mineral bases, and salts of the heavy minerals; and (4) a group known as substitution poisons, in which some chemical radical of the poison enters into combination with and replaces some chemical radical of the tissue. The most important of these are carbolic acid, sulfur dioxide, the various alkaloids, etc. Such a classification, while appealing to the chemist and to the student of the philosophy of pharmacology, has little application in a general work. Most modern writers therefore divide all poisonings into acute and chronic forms. Under acute poisons the principal group consists of those that act locally. They are the cause of local irritations which may go on to destruction of tissue. Such are the acids: sulfuric, hydrochloric, hydrofluoric, nitric, chromic, formic, oxalic, lactic, etc.; the strong alkalis, such as soda, potash, ammonia, calcium, etc.; special irritating resins, such as are found in cantharides, and in the oils of turpentine, cubebs, juniper, mezereum, pennyroyal, poison-ivy, etc. All these substances act directly at the point of application. The acids and alkalis have the property of combining with the water in the tissues, abstracting it and causing changes in the protoplasm, some liquefying it (as potash and soda), others charring and drying it (as sulfuric acid, nitric acid, etc.). The skin or mucous membrane acted on by these poisons, depending on the concentration of the substance and the length of time of the action, is first reddened, then there is an exudation of serum in the tissue, burning and destruction takes place, ulcers are formed, and the skin or mucous membrane is entirely destroyed. Pain is produced by the action which is usually very acute in character; and when the substances are taken into the stomach they usually cause nausea, vomiting (which may be bloody), excessive salivation, mucous slime, intense pain in the entire abdomen with a feeling of collapse, weak rapid pulse, cold extremities, blue lips, and, if the patient lives long enough, cholera-like diarrhea. Convulsions and coma usually precede death. The irritating resins do not, as a rule, act so intensely; yet the symptoms are much the same. Destruction of the tissue is not so marked, and in case of the volatile oils one gets the symptoms of this class of drugs.

The treatment of acute poisoning by acids consists in the free administration of mild alkalis. Thus, lime-water in copious doses is one of the best remedies. It is usually combined with milk or with albumen, being beaten up with white of eggs, so that one gets the action of the alkaline antidote and the demulcent action of the albumen as well. Mucilages, such as gum arabic and gum tragacanth, are also useful in the treatment of poisoning by acid. If lime-water is not available, one can scrape plaster from a wall, and, after straining, use the water in which it has been left for a short time. The treatment of burns on the surface of the body, following the

action of caustic acids, is similar to the general treatment of burns, antiseptic salves, such as oxid-of-zinc ointment, being the most widely used remedies.

Poisoning by alkalis is best treated by weak acids. Here the most efficacious acids are vinegar, and lemon or lime juice, either pure or as weak solutions of citric acid. In either case a prompt washing-out of the stomach with water which has been made alkaline in the case of acid-poisoning, and acid in the case of alkali-poisoning, is important. The special diagnosis of the specific acid or alkali which has caused the poisoning, is a technical problem which as a rule only the physician is capable of solving. There are no special modes of treatment for poisoning by the volatile oils and the resins just enumerated. The after-treatment usually consists of rest and demulcents, such as white of egg, mucilage, starch-paste, etc.

The heart poisons form a second class of acute poisons. The most important members of this group are digitalis, strophanthus, squills, dogbane, and lily of the valley. Poisoning by these substances is comparatively rare, although some of them are used by native tribes as arrow poisons (strophanthus) and employed in the killing of game and in warfare. The members of this group are used extensively in medicine as heart tonics, and occasionally symptoms of poisoning result from overdoses. The most characteristic signs brought about by large doses, or by concentrated smaller doses of these drugs are a marked reduction in pulse-rate associated with a very high increase in arterial tension. Following this stage, if the drug is pushed, the heart is noticed to fail, the pulse becomes rapid, feeble, irregular, and convulsive, the pressure falls, and death may result. It is characteristic of this whole group of poisons that, when taken into the body, they are eliminated only after a considerable period of time. This leads to what is known as accumulation, and is always to be borne in mind when this class of drugs is administered, for by continued use of small doses a comparatively large accumulation is possible.

Another group of poisons, whose action is in more or less contrast with that discussed in the foregoing, is one in which aconite is the most important member. Others are: veratrum, colchicum, lobelia, and larkspur. These drugs render the heart-beat slower in a manner somewhat similar to the digitalis group, namely by stimulation of the cardiac regulating-center in the medulla; but they give rise to direct poisoning of the heart-substance and dilate the blood-vessels, bringing about a loss of tension in the arteries rather than an increase.

Symptoms of poisoning from aconite, which is one of the most important members of this class, and which is also an extremely acute and violent poison, are very characteristic. Aconite is not a common plant in the United States, but the larkspur, a near relative, causes very similar symptoms. The root of aconite has been confused with that of horseradish by the peasants who gather it in the countries in which it grows; and the time

may not be far off before certain aconites which grow in the western part of the United States may enter into commerce and poisoning take place here similar to that which is known in Europe. The active principle of aconite is an alkaloid, *aconitin*, which is one of the most poisonous of all the alkaloids. The symptoms following the swallowing of a poisonous dose consist of a tingling in the mouth and pharynx, associated with a feeling of swelling of the lips and tongue, with burning and diminished sensibility. Then a peculiar sensation, as though ants were crawling over the skin, may be felt in the extremities; and this sensation may even progress to loss of sensibility of the peripheral nerves. These symptoms are followed by pain in the stomach, with excessive flow of saliva, nausea, vomiting, colic and diarrhea, and cold, clammy perspiration. The pulse-rate and respiration-rate sink, the former getting as low as 35 to 45 per minute, and the latter 10 to 15; and death may take place without much change in consciousness, although either delirium or coma may be present. The only method of treatment of poisoning by drugs of this class is by prompt evacuation of the contents of the stomach, the giving of hot water to aid elimination, and artificial respiration. Hot coffee is also useful. In discussing this class of drugs it should not be forgotten that the very widely used preparation of larkspur, employed for insect parasites of the hair, gives symptoms similar to those of aconite and should be treated in the same manner.

Poisons that act on the composition of the blood, whereby they enter into a more or less fixed combination with the hemoglobin and prevent the ordinary oxidizing functions of this substance, furnish another very important group. To this belong a large number of widely used remedies, the most important of which are the different chlorates, and the nitrites, saltpeter being one of the most important. Nitroglycerin, amyl nitrite, nitrobenzol (widely employed in dyeing), anilin and the anilin dyes and derivatives, and particularly some of the newer drugs used to counteract pain, such as phenacetin, acetanilid, and the numerous headache mixtures which contain this latter substance, such as phenalgin, antikamnia, ammonol, bromoseltzer, etc., etc., all belong to this class. All these drugs, when taken into the body in sufficiently large doses, have the property of fixing the hemoglobin, resulting in the formation of methemoglobin; and the characteristic symptoms are due to loss of the oxidizing capacity of the blood, although there are individual variations in them all. Such drugs as amyl nitrite and nitroglycerin are much more rapid and powerful in their action than are the weaker anilin derivatives such as phenacetin, acetanilid, etc.

The symptoms usually come on with a difficulty in respiration, and with shortness of breath; and the patient commences to feel cold and giddy, the skin becoming bluish or even livid. With increased reduction of temperature the patient may suffer from chills. Other severe symptoms may then develop, such as loss of sensibility of the skin, great weakness

of the muscles, and, finally, the characteristic convulsions and coma due to cyanosis. The treatment of poisoning by this class of drugs consists of prompt evacuation of the contents of the stomach, and artificial respiration which should be continued for some time.

The alcohol group is a term which may well be applied to another group of poisons consisting of alcohol itself and all those substances which contain the different alcohols or their allies, such as ether, chloroform, chloral, chloral hydrate, sulfonal, trional, tetronal, amylene hydrate, paraldehyde, etc. To this group belong many important sleep-producing remedies. Poisoning may be induced by all of them, depending on the amount taken, and the grade of concentration. The symptoms are so well known, as in the case of alcohol-poisoning, that further reference need not be made at this place, but the reader is referred to the chapter on **ALCOHOLISM**.

The alcohols and their allies constitute a most important group of nerve poisons, especially in Occidental lands; but another group serves a similar purpose for the Orient, namely the group of which opium is the most important and almost the only member. Opium contains morphin and methyl-morphin or codein, with some fourteen or fifteen other alkaloids. A number of other synthetic modifications of morphin are known under the names heroin, peroin, dionin, etc. These have a very characteristic action on the nervous structures.

The symptoms of poisoning by opium vary considerably in different individuals, but if sufficiently large doses are taken the first sign is usually that of a slight exaltation which may be manifested by some increase in the alertness of the individual; the attention seems to be a little more intense, although narrowed in scope, and for a time the perceptions of light, sound, touch, taste, etc., are slightly increased in acuteness. Some individuals suffer from nausea and vomiting at this time; and by the loss of the substance from the body the patient passes from under its influence. In others, however, there is a gradual benumbing of the senses; the patients have a very distinct feeling of well-being, the blood-vessels dilate, the extremities become warm and comfortable, and a moderate feeling of beatitude spreads over the entire body. All outside impressions, particularly those of a painful nature, are cut off, and the patient lives in a world of his own making, usually immersed in rapt or languorous thoughts of comfort. The stage of deepened lethargy follows, and the patient may sleep in a fitful manner, and on awaking have a very uncomfortable headache, a sense of nausea and vomiting, inability to pass urine, and itching and discomfort of the skin.

If, however, the dose has been larger, the symptoms of insensibility deepen, the breath becomes slow and snoring, the pupils, which have been slightly contracted heretofore, become much more markedly so, perspiration is absent, the skin becomes cold and clammy, although at first warm,

and little by little the patient passes into deeper and deeper coma, with slower and slower respiration, till paralysis of breathing causes death. The amount necessary for this result varies with individuals, but half a grain of morphin or a grain of opium has caused death in some cases. As for the symptoms which are due to chronic opium-poisoning, or the use of opium, all these have already been discussed under the head of **OPIUM-POISONING**. Indian hemp may also be classified with this group, although it has some variations of its own. See **CANNABIS INDICA**.

Poisons which act on the spinal cord comprise still another group. One set is capable of exciting the chief cells in this structure, while another set depresses the muscle terminals of the spinal nerves, so that they constitute contrasting groups. To the motor excitants, as they are termed, belong characteristically strychnin, the poison of tetanus, narcotin and thebain (two of the alkaloids of opium), and brucin, found also in one of the species of *Strychnos*; whereas the principal members of the motor depressant group are conium (poison-hemlock), and curare, an Indian arrow-poison of South America. The symptoms of poisoning by strychnin and the members of this group come on very rapidly. As these have been discussed in detail under the head of **STRYCHNIN-POISONING**, a reference to that article will suffice. For the symptoms of poisoning by a motor depressant, see **HEMLOCK-POISONING**.

The metallic poisons form another important and large group. Here the chief action consists of an interchange between the metal and the cells of the body in general. The blood and the tissue-cells of the various organs are involved, and great variation is to be found in the action of the different metals. Thus, some metals will have greater affinity for the tissues of the kidney and liver (as, for example, arsenic and phosphorus), while others primarily affect the tissues of the nervous system. For this reason general principles can not be easily drawn with reference to their toxicology, further than that they affect the entire metabolism of the body. As a rule this action is useful if small amounts of the drug are given, but the stage of irritation and stimulation rapidly passes into one of overstimulation and destruction. Hence the apparent disparity of action of these drugs when given in small doses and when given in larger ones. There is really no difference in the kind of action. It is solely one of degree.

The poisonous symptoms caused by the heavy metals are discussed in their respective chapters, and as the subject does not permit of accurate wide generalizations the reader is referred to the various special articles. See **ARSENIC**; **COPPER**; **IRON**; **LEAD**; and **PHOSPHORUS**; also **OCCUPATION DISEASES**.

The aromatic hydrocarbons, as they are known in chemistry, constitute still another important group of poisons. The most important of these is carbolic acid, and associated with this as to action are the innumerable

compounds, which, when taken into the body and broken down, form in the tissues substances resembling carbolic acid. The number of these is legion. The most important, however, are such preparations as creolin, cresol, creosol, benzol, guaiacol, resorcin, pyrocatechin, hydroquinone, salicylic acid and the salicylates, oil of wintergreen, tar, lysol, etc.

Most of these compounds have a local action, of an acute irritating nature, causing burning, or being caustic and destructive; and on absorption into the body they have an action on the blood similar to that already mentioned as causing methemoglobin, so that the symptoms resulting are a combination of the local irritating effects at the point of application as well as at the point of elimination, notably with the kidney, and with the blood itself as already noticed. A more detailed account of the symptoms caused by this class of poisons will be found in the section on CARBOLIC ACID.

The substances known as toxalbumins constitute a peculiar group of acute poisons. To this class belong the poison found in the seeds of the castor-oil bean (*ricinin*), a similar substance found in the seed of the wild licorice (*abrin*), the mushroom poison *phallin*, the poison of the Gila monster, the poisons of various snakes (notably the rattlesnake, the copper-head, and the cobra), and a number of bacterial poisons, particularly the toxins of the typhoid-bacillus and the diphtheria-bacillus, etc.

This is an intensely interesting class of poisons, the knowledge concerning which is of comparatively recent acquisition. Such is the condition of knowledge concerning this group that it is impossible to characterize it as yet. These poisons are termed *globulins*, and so far as is now known the destructive action which they cause is limited to the blood. They have a peculiar property of being able to dissolve the blood-cells in the body, and hence are known as hemolytic substances. This action is not unknown in some other poisons, for members of the phenol group (carbolic acid), when given in enormous doses, can produce similar blood destructions. But this group of toxalbumins is unique in its very destructive effect on the blood-cells. This renders it extremely difficult to treat patients poisoned by these substances, and their effect can be modified only by means of true specific antidotes which will prevent the destructive action. Some of these counteracting substances have been discussed in the section on IMMUNITY.

POLLUTIONS.—See SEMINAL LOSSES.

POMEGRANATE.—The rind of the fruit, or the bark of the stem and root, of *Punica granatum*, or pomegranate, a tree of the myrtle family. This drug has a specific action on tapeworms. This is due to the presence of two alkaloids, *pelletierin* and *isopelletierin*. Pelletierin is most commonly used, and is combined with tannic acid. The dose is from ten to twenty grains. An overdose may cause nausea and vomiting, giddiness, confusion, and marked weakness. Vision may be dimmed, or entirely lost temporarily.

POTASSIUM, SALTS OF.—Potassium is an important element in the human body, and is usually obtained from various salts occurring in plants. The uses to which potassium is put in the human body are various. It is important in determining the alkalinity of the blood; it plays a very important part in the process of clotting of the blood (see **HEMOPHILIA**); and it is of great importance in regulating, in some **unknown** manner, the force and regularity of muscular contractions. The salts of potassium have a limited application in medicine, notwithstanding the importance of the element in the physiological economies of the body. The citrate, tartrate, nitrate, and sulfate are used; but in their actions the potassium plays a minor rôle. See also **PERMANGANATE OF POTASSIUM**.

POTATOES.—The potato is an edible tuber of the *Solanum tuberosum*, a plant of the nightshade family. It is native to South America, whence it was introduced into Europe by Sir Walter Raleigh in 1586. It is now extensively cultivated in all civilized countries. Prior to the seventeenth century, however, its worth was not appreciated; and it was want and distress that finally made it a popular foodstuff. Potatoes are a welcome "stomach filler," especially among the poor; while to the rich they furnish a side-dish with which they do not wish to dispense. As an exclusive diet, however, potatoes are not suitable. A big belly, and wasted, emaciated limbs characterize the unfortunates who are unable to supplement a potato diet with the amounts of albumin and fat necessary to health.

Although the soil, and the ripeness of the vegetable, greatly influence the composition of the potato, the average constituents are about as follows: Water, 76 per cent.; starch, 21 per cent.; albumin, $1\frac{1}{2}$ per cent.; and slight traces of fat. On the other hand, potatoes are distinguished by their high percentage of potassium; and for this reason they require a sufficient amount of common salt in their preparation for the table, since otherwise they will cause marked digestive disturbances. Such disturbances of digestion are brought about also by potatoes that are insufficiently masticated, or fried very hard. It is necessary to cook the potato in order to transform its starch so that it may be digestible. Potatoes are most readily digested when mashed, whereas fried potatoes are most indigestible. Potatoes always answer their purpose best when taken in combination with other foodstuffs. They can be especially recommended in combination with milk, cheese, eggs, or other albuminous foods, and also with some lard. Potatoes that are unripe, frozen, or diseased, as well as those that have sprouted, are unwholesome.

POTT'S DISEASE.—See **BONE, INFLAMMATION OF**.

POULTICES.—Mollifying remedies applied externally in order to exert a local action on the skin, and through that also upon deeper organs. According to the purpose for which it is applied, a poultice may be cold, warm or hot, dry or moist.

Dry, heated poultices may consist of cloths, hot-water bags, or of cushions filled with herbs or sand. Warm poultices should have a temperature of about 75° F.; hot poultices should be heated to 90° F., or more. These poultices are used to allay pain.

Moist, heated poultices are usually applied over the site of a local inflammation. A linen cloth is dipped into water of the prescribed temperature, and is applied to the affected part of the body. In order to preserve the heat of the poultice, the moist cloth is covered with woolen cloths or with hot-water bottles. Steam-poultices are very popular. The affected part of the body is covered with flannel, on top of which is placed a cloth which has been heated with steam, or immersed in steaming hot water. This is again covered with flannel or woolen cloths. Moist poultices may be made also from hot pap (potato-mash, linseed-flour, etc.). The pap in itself has no curative qualities; it simply serves as a means of preserving the moist heat for a considerable length of time.

Dry, cold poultices are indicated in various febrile diseases, especially when accompanied with severe local pain. They may be applied in the shape of ice-bags, bottles filled with ice-water, or ice-cushions (see ICE). Special apparatus, consisting of hose made from rubber or flexible metal, through which cold water is kept running on the siphon principle, may be used on various parts of the body (see Fig. 338).

Moist, cold poultices are made with cloths which have been kept in ice-water for some time, and which must be wrung out well before being applied. They must be renewed as soon as they become warm; that is, every three to five minutes.

Cold poultices (dry as well as moist) are beneficial for wounds and inflammatory diseases, particularly for rush of blood to the head, inflammation of the meninges, and apoplexy.

To use poultices made from earth or mud in the belief that the "earth strength" in them is beneficial, is ridiculous, because no such thing as "earth strength" is known to science. Moreover, such poultices may be dangerous, causing infection of small wounds that may exist in the skin. The earth contains many harmful bacteria, for instance that of lockjaw (tetanus). The



FIG. 338. Apparatus for cooling the head.

belief that all diseases may be cured with earth-poultices or with earth-baths, can be ascribed only to ignorance.

Priesznitz's poultice consists of a linen cloth, which is soaked in cold water and wrung out, whereupon it is folded smoothly and applied to the affected part. This wet cloth is covered with rubber or with oiled silk, over which is placed a broad, dry, woolen cloth. The poultice becomes warm gradually, and is left on for an hour or more. These poultices are very beneficial in painful, inflammatory diseases. They are used around the neck in tonsillitis and diphtheria, over the chest and back in pleurisy and in inflammation of the lungs (see Fig. 339), over the stomach in colic and in



FIG. 339. Poultice for the chest and back.

peritonitis (see Fig. 340), over the abdomen in the presence of pains during menstruation, over the sacrum in lumbago, and for neuralgic pains. If allowed to remain on too long, these poultices may cause the skin to become red and irritated.

PREGNANCY.—The state of being with child. Pregnancy begins with the impregnation of the female germ-cell, or *ovum*, by the male element, or *spermatozoon*, and ends with the expulsion of the fetus. During its development in the mother's body the fetus is nourished by a temporary organ, the *placenta*, which is connected with the maternal blood-vessels by the navel-string, or *umbilical cord*. The time required for mature development averages between 275 and 280 days. During this time not only the pelvic organs, but the entire body of the mother undergo essential changes, the noticeable signs of which are called "symptoms of pregnancy." Proof of pregnancy can be obtained by the physician only after an internal exami-

nation. An absolutely certain diagnosis is generally impossible before the fourth month.

Among the early symptoms of pregnancy, the most noteworthy is the cessation of menstruation. This may, however, continue for several months in spite of pregnancy having taken place. Other early signs are nausea and vomiting, particularly in the morning. In nervous women this condition may become almost unbearable. Indigestion is also frequently an early sign of pregnancy, and the patients are mostly constipated. The pregnant woman changes in her appearance. Her features, owing to a diminished blood supply to the upper parts of the body, are apt to become



FIG. 340. Abdominal poultice.

pointed; and sudden attacks of dizziness may be ascribed to similar causes. On the other hand, the region of the abdomen and pelvis, the lower limbs, and the mammary glands swell. The glands become heavy, painful, and tense; and after several weeks a drop of milky fluid may be pressed out. The so-called "milk-veins" likewise become prominent, and the nipples grow darker. The abdomen becomes rounded and, as pregnancy advances, the skin of this region becomes more and more tense. Owing to congestion, the veins which carry blood from the pelvic organs to the heart become swollen in different localities. This is particularly noticeable in the blood-vessels of the external genitals, of the rectum (hemorrhoids), and of the thighs. A certain sign of pregnancy is the blue discoloration of the genitals, which results from this congestion of blood. A marked degree of

leucorrhœa (the whites) is likewise apt to develop from the same cause. There is also a pronounced irritability of the bladder, owing to congestion and to the pressure of the growing fetus. A frequent desire to urinate is a sign due to these causes.

About the fourth month the uterus rises above the pelvis into the abdominal cavity, and can then be felt through the abdominal wall. Soon after the mother commences to "feel life," owing to the jerking movements of the fetus. At about this time, or a little later, an experienced physician is able to distinguish the heart-beats of the fetus. "Feeling life" and the fetal heart-sounds are positive signs of pregnancy. In the sixth month of pregnancy the upper border of the uterus is at the height of the navel; in the ninth month it extends to the pit of the stomach. If the baby be large, or if an excessive amount of "waters" be present, or if there be twins, respiration may be interfered with. Sleep is usually disturbed by the inconvenience of lying on the back.

Relaxation of the abdominal wall gives rise to so-called "pendulous" abdomen. This may cause a faulty position of the fetus; and in order to prevent this, as well as to limit permanent distention of the abdominal muscles, it may be advisable to wear an abdominal bandage. Whenever pregnancy has begun, or if the patient has skipped a menstrual period and it seems probable that she is pregnant, great care must be taken to preserve her own health as well as that of her child. Miscarriage, with its disastrous consequences, is only of too frequent occurrence; and the mother should take special precautions to avoid it (see ABORTION). It is not necessary to omit the daily routine work of the house, unless it be excessive. Light household work is, in fact, advisable; but a pregnant woman should avoid all heavy work, as well as excessive attention to social duties, amusements, traveling, etc.

The conditions for a normal pregnancy are mental calm and cheerfulness, the proper amount of work and rest, moderation in everything, and avoidance of all nervous excitement. A carefully regulated mode of living will prove the best means of overcoming the disorders which occur at the beginning as well as at the end of pregnancy. Since these disorders are mostly of a nervous nature, it is absolutely wrong for a mother to treat herself with excessive tenderness, and to regard herself as an invalid. The diet should be restricted, especially during the latter half of pregnancy, and should consist of non-irritating, readily digestible foods, which do not tend to cause flatulence. Overindulgence in fatty, sweet, and farinaceous foods, as well as in liquids, is known to produce heavy infants, profuse waters, and difficult and delayed labor.

The frequent disorders of the stomach are partly due to indiscretion in diet, or are aggravated thereby. The bowels should be evacuated every day at a certain hour, and if necessary this should be brought about by

the aid of enemas or mild purges (rhubarb, cascara, Carlsbad salt, etc.). Before resorting to these remedies, an attempt should be made to regulate the stools by letting the first meal in the morning consist of a glass of water, some honey, prunes, plenty of butter, and Graham bread. If the vomiting becomes very severe, the family physician should be consulted. It is not wise for patients to take such a disturbance stoically, believing it to be unavoidable. Much may be done for this condition. Diarrhea may usually be effectively treated by dietetic measures, including the use of oatmeal gruel, arrowroot, etc.

Slight disturbances of circulation may occur during pregnancy, and are characterized by palpitation, dizziness, fainting spells, etc. These may be combated by lying down, and by taking a small dose of Hoffmann's anodyne. Dilatation of the veins of the leg may be treated by wrapping the limbs in elastic bandages. Constricting garments, corsets, and tight waistbands must be avoided. Toward the end of pregnancy the feet may become swollen, especially in the evening. This is a sign of congestion because the head of the fetus partly obstructs the blood-vessels by pressure on the pelvis. If the swelling be permanent, and if the hands and eyelids are also involved, a more serious affection of heart or kidneys may be the cause of the symptom. In this case immediate treatment by the family physician is necessary; otherwise the heart is apt to fail during birth, or poisoning may cause eclamptic convulsions. Both these conditions may lead to abortion, or to the death of the child. It is very important to have the physician examine the urine from time to time, with regard to its color, quantity, and sediments, as this may indicate the possible occurrence of eclampsia and make it practicable to avoid it. The urine must be voided every few hours, as an overfilled bladder is very liable to lead to retroversion of the uterus and to other disturbances, either during delivery or later.

The cultivation of self-control and of a resolute spirit capable of enduring pain are of great help to the mother as well as to her child. Unreasoning fears, even the so-called "maternal impressions," are to be avoided, as they act unfavorably on the nerves, on the sleep, on the appetite, and, later, on the labor. Pregnancy and delivery are normal processes, and the rare accidents which occasionally occur may almost invariably be avoided by the timely consultation of a physician. With regard to the "maternal impressions," not a single case has as yet been shown which could stand the test of serious criticism.

The doctrine of "maternal impressions" has no justification whatever. Some physicians may believe that deformities in the infant may result from sights or frights that have occurred in the mother's experience, but all the evidence of scientific embryology is against them. Fearful women should take comfort in knowing that these things are impossible. The possibility of inheritance of deformities is another matter. Many slight variations are

the skin of the female genitalia is very sensitive and overreacts to any cause of irritation. The skin of the female genitalia is very sensitive and overreacts to any cause of irritation. The skin of the female genitalia is very sensitive and overreacts to any cause of irritation. The skin of the female genitalia is very sensitive and overreacts to any cause of irritation. The skin of the female genitalia is very sensitive and overreacts to any cause of irritation.

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PRICKLY HEAT is a condition which is very frequent in summer months. It is caused by the greatly increased and constant irritation of the skin by heat and by clothing. Prickly heat is a condition which is very frequent in summer months. It is caused by the greatly increased and constant irritation of the skin by heat and by clothing. Prickly heat is a condition which is very frequent in summer months. It is caused by the greatly increased and constant irritation of the skin by heat and by clothing.



PLATE XVII.—NORMAL AND DISEASED CONDITIONS OF THE THORAX

1. Normal Thorax
2. Tuberculous Thorax
3. Emphysematous Thorax
4. Left-sided Retraction from Pneumia



passed down for generations. In any event, self-tormenting brooding does more harm to mother and child than the likelihood of any inheritance. It is to be borne in mind that operations, especially on the teeth, may occasionally cause premature labor in very excitable and sensitive persons. But if the operation be urgent, or if the sleep is disturbed by pain, it is more detrimental to omit the operation than to have it performed.

A pregnant woman should be careful about taking medicines which had been prescribed for her previously. Some medicines, such as quinin, may induce premature labor; others, such as morphin, may affect the infant injuriously. The resistance of the infant depends not only upon the properties inherited from its parents, but also upon influences which affect the mother during her pregnancy.

The laws determining the sex of the fetus are evidently very intricate; at any rate, they are known in part only. Arbitrary choice of sex in procreation is not yet possible. Nor is it always possible to determine the sex of the infant before birth, although the size of the fetus, the strength of its movements, and the fetal heart-sounds may afford ground for fairly accurate guessing on the part of the physician.

Poisons and bacteria can not readily enter the mother's body during pregnancy. The infant is, to a certain extent, protected by the interposition of the placenta, and it is guarded against coarser external injuries by the decidua and by the amniotic sac filled with fluid, provided the entire ovum was favorably lodged in the uterine membrane. The lodging of the ovum too near the mouth of the womb may result in miscarriage. If the ovum, after fecundation, fails to descend to the womb, it may remain either in the tube or in the ovary, or it may later enter the abdominal cavity. According to the position of the ovum, these abnormalities give rise to a tubal, an ovarian, or an abdominal pregnancy. These are usually very serious accidents, because the mother is exposed to the danger of rupture of the thin walls of the organ, accompanied with profuse internal hemorrhages and extremely severe pain. Operation sometimes saves the patient's life, or she may recover without operative interference. Only a judicious physician or surgeon can decide. See also the article on REPRODUCTION, as well as the chapter on THE ORGANS OF GENERATION (pp. 72-77).

PRICKLY HEAT.—A skin-affection which is very frequent in summer and in tropical countries. It is due to the greatly increased and constant secretion of sweat, and to the irritation produced by clothing. Prickly heat usually develops very rapidly. On superficial examination the affected parts of the skin appear to be red surfaces; but on closer examination it is seen that innumerable, closely crowded, minute, red nodules cause this appearance. These nodules develop into small blisters. If these rupture, larger or smaller portions of the skin become sore, especially those parts of the body which are irritated by closely adhering garments. The throat,

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PLATE XVII.—NORMAL AND DISEASED CONDITIONS OF THE THORAX

- 1. Normal Thorax
- 2. Tuberculous Thorax
- 3. Emphysematous Thorax
- 4. Left sided Retraction from Pleurisy



3

It is seen in the following cases
that the disease is not confined to
the lungs, but may occur
in other parts of the chest. In
the first case, the patient was
not cured.

The following cases are of the
type of disease which may
occur in the chest, but
not in the lungs, and are
not cured.

Very few cases of the
disease are cured, and
the disease is not
cured in the lungs.

PLATE XVII.—NORMAL AND DISEASED CONDITIONS OF THE THORAX

1. Normal Thorax

2. Tuberculous Thorax

3. Emphysematous Thorax

4. Left-sided Retraction from Pleurisy



1



2



3



4

the wrists, the waist, and the shoulders are particularly susceptible. The eruption is accompanied by severe itching, pricking, and burning of the skin, increasing with every new appearance of sweat, and causing the patients to scratch themselves. The disturbances may be so marked that the patients can scarcely rest during the night. In healthy adults prickly heat, though very annoying, is otherwise without danger; but in delicate children it may eventually develop into a serious disorder. Special care should therefore be taken to keep a child's skin in a healthy condition.

The duration of prickly heat varies. In mild cases the eruption disappears after a few days; but if new nodules continuously appear, the affection may be protracted for weeks or months. Cooler weather generally effects a cure.

The treatment, as well as the prevention, of prickly heat requires limitation of the activity of the sweat-glands. It is necessary, therefore, during the hot season, as well as in the tropics, to wear light, porous garments which do not adhere closely to the body. Underwear made of fine, smooth cotton-weave, or shirts with medium-large meshes, should be selected. Woolen underwear is especially unsuitable. To diminish the secretion of sweat, one should avoid bodily exertions as much as possible, and restrict the ingestion of fluids to a minimum. Another requirement is cleanliness. Underwear saturated with sweat must be changed every day; and the daily bath, so essential in the tropics and during hot weather, must not be suspended even if it should aggravate the disturbances for the time being. Soap should not be used with the bath; and it is advisable, after each bath, to dust the skin with flour or with talcum-powder, or to rub it with some bland ointment or oil.

PROSTATITIS.—Inflammation of the prostate gland (see p. 73). This condition is generally a result of gonorrhea of the posterior urethra. There are two main forms of prostatitis, a rapid and an insidious type. The rapid form is accompanied by severe pain, by difficulty in urinating or complete retention of urine, by fever and chills, and in some cases by the formation of an abscess which tends to rupture into the urethra or into the rectum or externally through the perineum. Proper treatment may sometimes effect a total reduction of the inflammation. In other cases the suppuration reappears, and there is a rupture in several directions, leading to permanent deformity. This rapid type of inflammation is best prevented by the proper and timely treatment of gonorrhea. If signs of a beginning inflammation (retention of urine, painful pressure in the rectum and perineum, fever and chills) be already present, it is advisable to rest in bed, to effect a light movement of the bowels, and to consult a physician. Timely medical advice is important in order, if possible, to prevent the rupture of pus into the bladder or into the peritoneal cavity, which complication may cause a very dangerous blood-poisoning.

In the case of insidious prostatitis, gonorrhea of the urethra plays a chief part; but sexual excesses, violent masturbation, and injuries must also be taken into consideration. There are symptoms of dull pressure in the perineum, radiating into the rectum, and some burning pain while urinating. Constipation, which often occurs simultaneously, tends to aggravate the unpleasant sensations in the region of the perineum. As is usually the case in diseases of the sexual organs, there appear sooner or later certain nervous complications, such as loss of appetite, disinclination for work, and mental dulness. There are also pains in the sacrum and in the back, decreased power of procreation, and melancholy. In all diseases of the urethra a reputable physician should be consulted. The prospects for a cure are not unfavorable. The treatment, however, usually demands much time and patience, but if properly carried out the results are generally satisfactory.

PRUNUS VIRGINIANA.—The dried bark of the wild cherry tree, or *Prunus serotina*. It is reddish in color, and has a peculiar bitter flavor like that of peach-stones. This is due to the presence of a very small amount of prussic acid. It is sometimes used as a bitter tonic, but more often in the form of sirup, as a basis for cough mixtures. The dose of the sirup is from one to four teaspoonfuls.

PRUSSIC ACID.—A poisonous acid occurring naturally in oil of bitter almonds, in the bark of wild cherry, in the leaves of the cherry-laurel, and in a number of seeds of the rose family. Artificially it is prepared from the cyanides. Prussic acid is not by any means the most poisonous substance known, most of the alkaloids being weight for weight much more powerful; but it is an extremely active poison in small doses (1 to 2 grains) and usually kills very rapidly. The symptoms of acute poisoning usually come on very promptly. The patient often collapses suddenly, with symptoms of extreme weakness and heart stoppage, the lips being usually red. In sub-acute poisoning, nausea and vomiting may presage the very marked weakness and giddiness; and the patient may be dizzy for some time before losing consciousness. The only practical treatment is by prompt evacuation of the stomach, the administration of stimulants (alcoholic drinks, coffee, etc.), the application of heat, and hot enemas of salt water.

PSORIASIS.—See HERPES.

PTOMAIN-POISONING.—Ptomain is a poisonous alkaloid which is present in decomposing animal matter. The eating of decayed meat, fish, oysters, cheese, etc., may give rise to acute poisoning. Although the manifestations of disease are not alike in all such instances, some of them are almost invariably observed in all cases. The symptoms may begin as early as half an hour after the ingestion of the poisonous food, but they usually appear some time during the first twenty-four hours. They consist in nausea, retching and vomiting, and usually violent diarrhea resembling an attack of cholera. In some cases, however, there is persistent consti-

pation. Severe lassitude and general weakness ensue, followed by violent thirst, chills, dilatation of the pupils, dizziness (even when lying down), drooping of the upper eyelids, difficulty of breathing, twitching of the muscles, paralysis of the limbs, and convulsions. Many cases (such as those following poisoning from fish, oysters, or decayed brain) are accompanied by fever, and are further characterized by skin eruptions which later peel off. These poisonings are always very dangerous, and may terminate fatally in from one to fourteen days. Some cases, however, may be cured within a few hours. It is necessary in all cases to call a physician as quickly as possible, as nothing can be expected from the use of domestic remedies, except from such measures as tend to induce or promote vomiting.

Unfortunately, little can be said with reference to the prevention of this form of poisoning. It is self-evident that soft and stinking meat, sausages which are jelly-like and smeary within, and decayed fish must not be eaten. But it is very often the case that the decayed condition of these food-stuffs can be recognized neither by inspection nor by taste and smell. Nor is their preparation a protection, for many cases are on record in which poisoning has been caused by cooked as well as by smoked meat, fish, sausages, etc. The most dangerous articles of food are the brain, sweetbreads, and liver of animals; the roe of fish; and sausages.

PUERPERAL FEVER.—A traumatic fever caused by poisonous bacteria which enter the wounds caused in the internal and external sexual parts during delivery. The disease was formerly erroneously called "milk-fever." The bacteria find their way into the vagina during confinement, through the medium of dirty fingers or other objects. They may, however, have existed in the pelvic organs (tubes, ovaries, womb, etc.) before pregnancy; or they may have reached these parts during confinement by infection from other organs, as, for instance, in influenza.

The early recognition of the first symptoms of puerperal fever, and the overcoming of the disease at the beginning, are the most important factors in the treatment. Later on very little can be done except to keep up the patient's strength, so that the body may be able to combat the poisons generated by the bacteria. The conspicuous and warning symptoms of the disease consist in a rise of the body temperature above 100° F., sleeplessness, headache, loss of appetite, diarrhea, profuse perspiration or an abnormally dry skin, changes in the lochial discharge (causing it to resemble burnt raspberry-jelly), extraordinarily severe after-pains (especially in first births), swelling and soreness of the external wounds, and gaping of these wounds if they have been sutured. When such symptoms become noticeable, the patient should remain absolutely quiet on her back, and the physician summoned without delay in order to determine further treatment.

The proper measures for prevention are the prompt treatment of any occurring disorders, and scrupulous cleanliness. In case of any abdominal

disease, this must receive immediate and energetic treatment. This is particularly important in the case of catarrh of the womb (an affection which is often totally neglected), and especially when there is a mucous discharge. If pregnancy already exist, very little can be done without affecting its course. Should the condition become aggravated, operative interference may be necessary. The second point to be observed in the prevention of puerperal fever, is the delivery. Here, as during the entire period of pregnancy, the most scrupulous cleanliness of the body is necessary. Also the body-linen, the clothes, the bedding, and all objects and persons with which the patient comes in direct or indirect contact must be absolutely clean. If cleanliness is lacking, the most powerful antiseptic remedies are useless. In such cases it is only sheer luck if fever does not appear. Bacteria coming from discharging wounds, from persons sick with puerperal fever, from erysipelas, diphtheria, scarlet fever, etc., or from decomposed meat or corpses, are very poisonous. Persons who have been exposed to such contagion must under no circumstances ever enter the sick-room. Doctors and nurses who are careless about the cleanliness of their hands should be avoided.

Since the proper precautionary measures have been followed by the attendants at childbirth, there has been a considerable decrease in the number of cases of, and in the mortality from, puerperal fever. This wonderful progress, made within the last fifty years, is due solely to the successful efforts of scientific medicine. Oliver Wendell Holmes is to be credited with having been the first to announce the contagiousness of puerperal fever. The medical profession is, however, far from having attained its ideal of a confinement entirely free from fever. This is not the fault of the method which, when compared with former times, has proved admirable; but it is due to various factors which it is difficult to influence. Among these, the patients and the lay attendants are the more important. The former need enlightenment, and the latter more supervision and better equipment for their work.

When childbirth begins, the patient should be given a vaginal injection of about one pint of warm water. While this is being injected she should lie on her back or on the side, breathing deeply; and the water should be allowed to flow in slowly. The nurse should also give the external sexual parts, as well as the thighs and abdomen, a preliminary cleaning with soap and warm water, whereupon the doctor should be notified of the approaching childbirth. As to the nurse, the patient should make inquiries regarding her faithfulness, and especially as to whether she is scrupulously clean, and conscientious in following the physician's directions, particularly with regard to disinfection. No nurse should be engaged who accepts new cases while caring for a confined woman suffering from fever, suppurating wounds, or other contagious diseases. She is violating the moral law if she does

this; and in some countries she even violates statutes. Hands that have been exposed to poisonous bacteria can not be rendered absolutely free from germs by one disinfection, no matter how strong; whereas the skin, in the course of a short time, cleans itself. In Germany there is a law commanding a midwife who has had charge of a patient suffering from puerperal fever to discontinue her services for a time, in the interest of subsequent cases.

For their own sake patients should know that puerperal infection is most frequently communicated through dirty hands or instruments. An uncleanly physician or nurse is a menace in the treatment of childbirth. During the birth of the child, as well as afterwards, the internal parts must not be touched unless the physician deems it necessary. The external sexual parts, however, as well as the entire body, must be carefully washed every day, but only by a person who has properly disinfected her own hands. The bowel movements, as well as the evacuation of the bladder, must receive careful attention.

PUMPKIN-SEED.—See **PEPO**.

PUPILS, CHANGES IN.—The observation of the width of the pupils, and of the changes they undergo when light strikes the eyes, is of the utmost importance in the recognition of diseases of the nervous system. On the basis of such observation a physician is often in a position to discover a beginning affection of the nervous system, the presence of which could not be sufficiently demonstrated from the other symptoms alone. To correctly determine the changes in the pupils requires practise and thorough experience.

PURPURA.—A disease which is marked by the appearance on the skin and mucous membranes of livid patches of various sizes, caused by extravasation of blood. These spots, which are usually first seen on the legs, are of a brownish-red color, and do not disappear under pressure. The condition may be unaccompanied by any other symptoms, or there may be manifestations of varying degrees of severity. A number of diseases is designated by the general term "purpura," and the distinctions can be determined only by a physician. The layman should know, however, that while the purpuric patches may be nothing more than skin lesions, they may also result from rheumatism or from a general disease with severe systemic disturbances and of doubtful prognosis. Attention is particularly directed to the rheumatic form of purpura, which often causes the patient a great deal of anxiety for which there is little foundation. The outcome of this trouble is always favorable, although its appearance may be accompanied by an increase in the general symptoms and in the severity of the local pains. The danger is increased when blood is extravasated into some of the important internal organs (such as the brain or the kidneys) instead of into the skin or the mucous membranes. In addition to the effects due to the loss of blood, there are functional disturbances of the affected organs. The manifestations

of the disease may closely resemble the picture produced by scurvy; but the correct diagnosis can readily be made by a schooled physician, and the recognition of the differences greatly affects the prognosis. Every detail of treatment must be carefully followed out, because severe hemorrhages into internal organs may be followed by fatal results.

PUS.—A viscid or creamy secretion produced during the course of an acute or chronic inflammation. It consists of the white blood-corpuscles which are distributed in great number through the inflamed area, and of the disintegrated tissue itself. Pus is a yellowish, more or less thick fluid; and in addition to the elements already noted, it contains also bacteria, dead cells, etc., mixed with the tissue fluids. As pus contains the disease-producing germs in large number, it is a source of danger to other wounds. All dressings on which pus is present should, therefore, be burned; soiled linen should be thoroughly boiled, and clothing disinfected. Hands that have been in contact with pus must be scrubbed for at least five minutes with soap and warm water, and then immersed in a solution of germicidal fluid for several minutes.

PUTRID FEVER.—See **PYEMIA AND SEPTEMIA.**

PYELITIS.—See *Inflammation of the Pelvis of the Kidney*, s. v. **KIDNEYS, DISEASES OF.**

PYEMIA AND SEPTEMIA.—Conditions due to the entrance into the body of poisonous or putrefactive organisms, usually the bacteria known as *Staphylococcus pyogenes* and *Streptococcus pyogenes*. In pyemia the germs are transmitted from an already existing focus of pus, along the circulatory channels, to various organs, where they likewise produce suppuration. Septemia is also due to infection with bacteria, but is characterized by severe additional symptoms due to the bacterial poisons. The latter affection may indicate solely the absorption of the poisons from pyogenic bacteria, rather than the spread of the bacteria themselves.

Infection may take place from very minute wounds or injuries of the skin or mucous membranes, such as may be produced by dirty nails, pens, etc. It may result also from abscesses or boils, from purulent inflammations, or from pockets of pus in various organs of the body. Infection may also follow childbirths, abortions, suppurative diseases of the middle ear with involvement of the cerebral blood-sinus, and operations by contamination of the wound. In many instances it may be impossible to determine the original site of the infection.

Both diseases may appear simultaneously, and their symptoms are about the same. The initial manifestations are headache, pain in the joints, fatigue, loss of appetite, vomiting, frequent chills, and an irregular fever, alternating between an almost normal and a very high temperature. The pulse is very rapid. Septemia may end fatally if the suppurative process invade any of the vital organs. The outcome is favorable only in excep-

tional cases; permanent disability of one kind or another usually remains, very often in the heart or kidneys. Pyemia pursues an even more virulent course, and is usually fatal. In addition to the early symptoms previously mentioned, the patient soon experiences extreme exhaustion, becomes restless, delirious, or unconscious, or is seized with convulsions. The tongue is dry and dark red in color, the breathing rapid and labored, and the face bluish. The skin shows red patches or subcutaneous hemorrhages, the joints become swollen, and the stools are bloody. Death finally results from extreme exhaustion.

Bearing in mind the rapid and usually fatal course of these diseases, it is essential to obtain prompt treatment of any suppurative process which is liable to furnish a starting point for a general infection. All wounds and injuries, no matter how slight, should be carefully cleansed, and protected from contamination. See BLOOD-POISONING.

PYROGALLOL.—A whitish, crystalline substance obtained by distillation of gallic acid. It soon turns black if exposed to the air, and is readily soluble in water. Pyrogallol is used only externally, and is slightly antiseptic and stimulating. It is applied in an ointment in certain diseases of the skin, as psoriasis. It stains the skin a dark brown, and is not a suitable drug to use on large surfaces.

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QUASSIA.—The wood of *Picræna excelsa*, a large West-Indian tree. It contains several neutral substances known as *quassins*, which give it an exceedingly bitter taste. Quassia is used as a bitter tonic, and is given before meals to stimulate the appetite and to increase the flow of the digestive juices. The infusion of quassia is valuable in the destruction of seat-worms or threadworms, being injected into the rectum and used as a wash. The dose of the extract of quassia is from one to three grains.

QUERCUS.—The dried inner bark of the white and the black oaks, *Quercus alba*, and *Quercus tinctoria*. The latter, however, is used very little in medicine, as it stains everything with which it comes in contact. Quercus contains tannic acid, and it is on account of the astringent action of this acid that it is used. The infusion is used freely as an astringent gargle, douche, or wash, wherever one is indicated.

QUERULOUS PARANOIA.—See INSANITY.

QUININ.—See CINCHONA.

QUINSY.—See TONSILLITIS.

R

RABIES (HYDROPHOBIA).—An infectious disease communicated to man by the bite of animals suffering from the disease. It may be transmitted also through the medium of the saliva or the blood of rabid animals. Dogs, cats, foxes, and wolves are among the animals that most frequently convey the infection. The danger of contracting the disease from animal bites is the greater the more numerous these bites are, the deeper they enter the flesh, the nearer they are situated to the brain or to the spinal cord, and the younger the person who is bitten. When the garments covering the wound are not torn by the bite, the danger of infection is much reduced. The disease does not become manifest immediately following infection, but requires a comparatively long time before it develops. The period of incubation usually fluctuates between three and eight weeks, in rare cases extending to a year or longer.

The first manifestations of rabies in man consist in dragging pains about the region of the bite which is usually swollen, general lassitude and depression, fear, restlessness, and slight fever. After a few days, more distinct symptoms appear. Spasms of the muscles of respiration and of swallowing manifest themselves on the patient's slightest attempt to eat or to drink; and a tormenting thirst is usually present at the same time. At a later stage of the disease, sensations of unspeakable fear and suffering are called forth by the slightest irritation, by the touching of a cold object, by the sight of a glass, even by the mere thought of drinking (not necessarily water, but any beverage). These symptoms have given the disease its name "hydrophobia," which literally means "dread of water." In addition to these symptoms, the patient becomes mentally excited, suffers from delusions, and becomes subject to attacks of rage, during which he may strike, bite, or gasp. This condition of excessive irritability gradually subsides, and the patient becomes more quiet, and able to quench his thirst. In severe cases the patient develops a state of general exhaustion, and death occurs, either from cessation of respiration or from weakness of the heart. The duration of the disease averages five to six days, and usually terminates fatally.

The prevention of rabies requires prompt and energetic treatment of a wound inflicted by a rabid animal. Such a wound should at once be squeezed, rinsed with pure water, and cauterized, either with a hot iron or with a strong acid. It has been proved by experience that only cauterizing which is done within five minutes after the bite offers a chance of success. The only life-saving treatment is Pasteur's method of inoculation. This consists in injecting into the body of the patient a trituration prepared with bouillon made from the spinal marrow of animals that have been artificially

inoculated. A combination of Pasteur's method with that of Babes' is claimed to give better results. By this union of methods the Pasteur injection of a triturated preparation of spinal marrow substance is combined with the serum of animals which, by continued inoculations with increasing amounts of the poison, have been rendered immune to the disease. This method is usually effective in even the most severe cases, provided that treatment be begun as early as possible after the bite. Once the disease has developed it is rarely possible to effect a cure.

The foremost institutes for the treatment of rabies are located as follows: In *Europe*: Berlin, Germany; Vienna, Austria; Budapest, Hungary; London, England; Bucharest, Rumania; and Paris, France. In the *United States*: New York, N. Y., and Chicago, Ill. Patients should always obtain their physician's advice before going to an institute for treatment, many of the so-called "Pasteur Institutes" being absolutely unreliable.

RACHITIS.—See RICKETS.

RANULA (FROG-TONGUE).—A tumor situated in the cavity of the mouth, under the tongue, either on the right or on the left side. It is benign in its nature, and is generally annoying only because of its size. The tumor, which contains a semi-fluid, adhesive mucus, can not be cured by a simple incision, as it gradually fills again. A permanent cure can be effected only by removing the entire pouch which contains the fluid.

RATANY.—See KRAMERIA.

RECTUM, DISEASES OF.—The rectum is the lower end of the large intestine, and extends from the sigmoid flexure to the anus (see p. 57). This part of the intestinal tract may be the seat of a number of severe and painful diseases. The most common of these affections is due to dilated veins, constituting the condition known as piles or HEMORRHOIDS (which see). Some of the other affections of the rectum are discussed in the following paragraphs.

Cancer of the Rectum.—This is a very grave disease which gives promise of permanent cure only if the cancerous growth be removed early and completely. Prompt recognition of the affection, and speedy surgical treatment are, therefore, of the utmost importance. The first manifestations of rectal cancer consist in a certain feeling of malaise, some pressure in the rectum, and the discharge of blood and mucus, especially on defecation. The form of the feces is often thinner than usual, sometimes only as thick as a pipe-stem. As a rule the condition is accompanied by constipation and by pain at stools. An individual over forty years of age, who has hemorrhages from the rectum, or who discharges mucus and blood with the stools, should never rest content with a diagnosis of hemorrhoids. A careful examination of the rectum by a physician is always necessary; and not only the anal opening must be inspected, but it is essential to have the entire rectum explored. Owing to the fact that many patients who

suffer from rectal cancer fail to submit to an early examination, it frequently happens that surgical treatment is deferred until the cancerous growth has advanced so far that the prospects of a permanent cure are but slight, or that an operation is no longer hopeful.

The technique for the operative removal of rectal cancer has made great progress during recent years. Surgeons are able to remove cancerous growths which are situated high up in the rectum. Even in cases where the cancer can no longer be removed, the patients can be afforded relief by means of an artificial anus. The stools are passed through this artificial opening, and in this way the violent pain caused by defecation is avoided. The artificial anus is closed by specially constructed pads, which are removed only for the purpose of discharging excrements.

Catarrh of the Rectum.—This condition is due to chronic irritation of the mucous membrane lining the rectum. Hardened masses of excrements which remain in the rectum for some time may be the chief causes of irritation; or enemas given continuously and unskilfully may act as irritants. Exposure to cold, and the presence of intestinal worms are likewise causative factors. The catarrhal inflammation very often develops in consequence of other affections of the rectum, following or accompanying hemorrhoids and ulcers particularly. The symptoms of rectal catarrh are a constant inclination to defecate, pain in the anus, and the passage of blood and mucus, either alone or with the feces. In some cases pus may be discharged. The affection may be accompanied by periodic diarrhea, but in the majority of cases the stools are rather hard. Blood and mucus are often passed constantly, but in small quantities only, being present as a thin covering on top of the excrements.

Treatment of the affection requires, above all, the removal of the cause, particularly of the persistent constipation. Regulation of the bowel movements is the first step in the treatment of rectal catarrh. The use of laxatives is permissible, but only under proper medical guidance. The rectum may be cleansed of mucus and other substances by washing it out with warm water or with soda-solutions. Special treatment with astringent remedies must be left to the physician. It is of great importance that the anus be kept clean, and for this purpose lukewarm sitz-baths may be recommended. These baths also exert a favorable influence on the disease itself. If worms be recognized as the cause of the catarrh, it is obvious that these parasites must be destroyed.

Fistula of the Rectum.—A fistula is an abnormal canal, opening either into a body cavity or into the external skin, or terminating blindly in some organ or tissue. A suppurating canal extending from the interior of the rectum to the skin in the neighborhood of the anus, establishing communication between the rectum and the external air, is designated as a *complete* rectal fistula (see Fig. 341a). If the canal reach the external

skin without rupturing the same, it is called a *blind internal* rectal fistula (see Fig. 341*b*); and if it extend from the external skin to the rectum without perforating the mucous membrane of the latter, it is termed a *blind external* rectal fistula (see Fig. 341*c*). These fistulæ are extremely annoying to the patient, owing to the constant discharge of small amounts of pus and blood. They are, moreover, healed with great difficulty, since they, in the majority of cases, burrow in different directions, thus becoming very complex. The only rational treatment of such fistulæ is by operation. This can be done painlessly by aid of a local anesthetic (cocain), and as a rule the patient is confined to his room for only a few days.

Rectal fistulæ are very frequently of a tuberculous nature, in which case they are more serious, and require careful local and general treatment. The use of salves, powders, suppositories, etc., in the treatment of fistulæ is fruitless. Only quacks or incompetent physicians will claim to be able

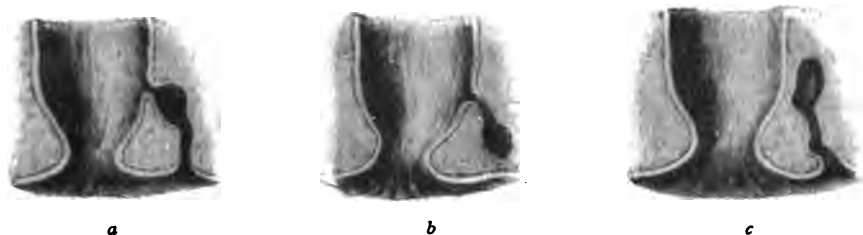


FIG. 341. *a*, complete rectal fistula; *b*, blind internal rectal fistula; *c*, blind external rectal fistula.

to "cure" fistulæ by such means. Rectal fistulæ may extend also into the urethra (*recto-urethral fistula*), into the bladder (*recto-vesical fistula*), or into the vagina (*recto-vaginal fistula*), giving rise to severe complications.

Prolapse of the Rectum. A condition in which a smaller or larger portion of the rectum protrudes through the anal opening. In children this unpleasant condition generally affects only the mucous membrane of the rectum; and occasionally this is the case in adults also. The affection may be very severe. In some cases, portions more than one foot long have been extruded from the anus. Violent straining at stools is often the cause of this condition. This may occur in persistent constipation, in the presence of a stone in the bladder, in narrowing of the urethra, etc. Prolapse of the rectum is observed also after the bearing of many children. The mucous membrane of the extruded part usually becomes inflamed, and bleeds slightly.

In children, the affection may be readily cured. The diet and the bowels should be regulated, and the prolapse retained by suitable bandages. In adults, regulation of the bowels is equally important. Bladder-stones should be removed, and a narrowed urethra widened. If the condition persist, operative treatment is necessary, and is usually successful.

Tenesmus of the Rectum.—This is a frequent accompaniment of many diseases of the bowels, particularly of the rectum, and is characterized by a frequent or constant inclination to defecate, without being able to do so. This rectal tenesmus is caused by a spasmodic contraction of the muscles of the anus, resulting from an abnormal irritation in the rectum. Accompanying this there is frequently an itching sensation in that portion of the gut. Among the causes of rectal tenesmus may be mentioned: Fissures, hemorrhoids, catarrh, swellings and ulcers in the rectum or in the colon, and hardened masses of feces following constipation. The condition persists until the cause is removed. Lukewarm or warm sitz-baths are very efficacious in allaying some of the painful symptoms. Medicine in the form of suppositories may be taken to cure the spasms of the anal ring-muscles, or sphincters. Attention should be paid to regular and easy evacuation of the bowels.

RELAPSING FEVER.—An acute, infectious disease produced by the *Spirillum Obermeieri*, a micro-organism having the form of a corkscrew (see Fig. 65). The physician, Dr. Obermeyer, who first discovered the bacteria

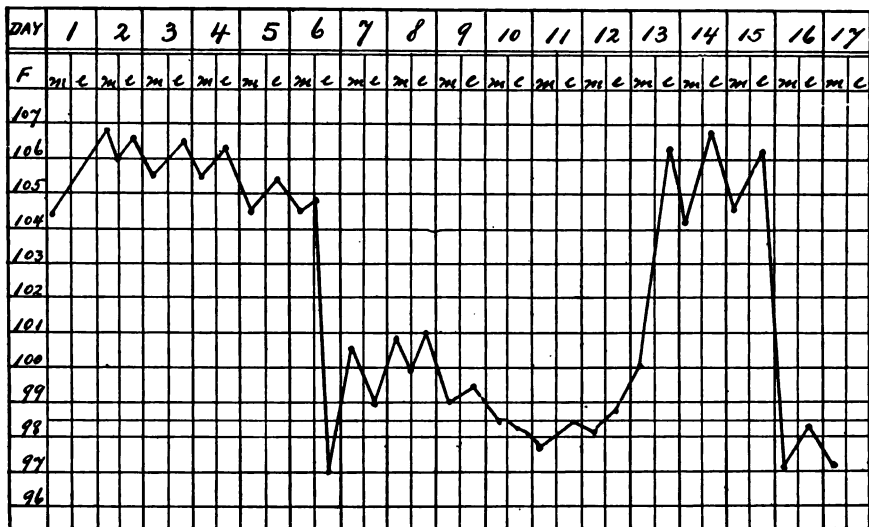


FIG. 342. Temperature-chart showing typical course of relapsing fever.

in the blood of patients suffering from the disease, later fell a victim to that very affection. The disease always occurs in epidemics, but in general it is rare. It is not known in which manner the infection is spread. The disease usually begins suddenly with a violent chill, general malaise, intense headache, and a sensation of heaviness in the limbs. The temperature rises steadily, reaching 104° to 106° F. at the end of the second day. It then remains at this point for three or four days, or more, and then drops suddenly. The skin becomes hot and dry, and turns a dirty yellow; the

tongue is coated; the pulse is greatly accelerated; and the muscles, especially those of the calves of the legs, become sensitive to the slightest touch.

The marked characteristic of the disease is the peculiar course of the fever. As already outlined, the temperature reaches a maximum within two days, remains high for three or four days, and then drops very suddenly, sometimes going as much as three degrees below the normal. It then remains about normal for a week or more, often fourteen days, the patient being apparently well, when a second period of equally high fever sets in, with a recurrence of all the symptoms. In many cases a second interval is followed by a third attack of fever; and even a fourth and fifth recurrence of this strange disease have been observed. The subsequent attacks of fever gradually become of shorter duration, finally lasting only one day. The disease is usually found only among the crowded and poorly fed populations. It usually terminates in recovery, the mortality being at most two to four per cent. The recognition of relapsing fever depends upon its peculiar course, and upon the finding of the characteristic spirillum in the blood. Up to the present time no certain remedy has been found. The treatment is usually restricted to the support of the patient, and to the avoidance of dangerous complications.

RENAL COLIC.—See KIDNEYS, DISEASES OF.

REPRODUCTION.—The process by which the various species of organized beings are perpetuated. It includes the production, growth, and development of new germs, and the changes which at different periods in the life of the individual take place in the organs and their functions, as well as in external form. A double process of renovation and decay is constantly taking place in the organs and tissues, and although the nutritive process seems to maintain the structure of the body at a certain point from moment to moment, yet if observations be separated by a considerable lapse of time a different state of affairs will be detected. Thus, the vital functions, so far from remaining indefinitely the same, pass through a definite series of progressive changes which end in their final cessation. Birth, nourishment, development to maturity, retrogression, and death, are repeated again and again in the individuals; while the species is maintained by the constant accession of new organisms, generated from the old ones, and similar to them. This fact, that the young animals and plants are of the same kind as their parents, is so much a matter of daily observation that it is difficult for the lay mind to realize its importance and remarkableness as a law of reproduction.

It is not intended to assert that the anatomical characteristics of a species may not become modified by long lapse of time. Geology would refute such an assertion, making it evident that the appearance of a species have been markedly changed through very long periods, and that certain

species have failed to maintain themselves and disappeared entirely. But the fact remains, that at any one time each species preserves its essential characteristics, and remains distinct from any others of the same period.

The marked difference in appearance which exists between the young at birth and their parents is another striking fact in the study of reproduction. In some species, especially among the invertebrates, this difference amounts to a degree which has made it difficult for scientists to identify the young as the actual progeny of their parents; and at times it has even lent color to the hypothesis of spontaneous generation—that is, the production of living beings from inanimate material; in short, progeny without parents. This hypothesis, however, has never been established in a single instance; and a number of the organisms which were supposed by some to be so generated have been shown, by acute and painstaking experiment and observation, to belong to a definite cycle, often long and involved, which ultimately resulted in the development of organisms exactly like the parents from which the apparently unrelated progeny actually sprung. The difficulty of keeping such cycles under continuous observation is what makes them seem mysterious. In reality, more familiar ones are equally remarkable. For instance, if we were unable to see the process by which the caterpillar grows to resemble its parent, the butterfly, we might be very loath to believe in their identity. It is because every child can catch a caterpillar and watch the spinning of the cocoon and the emergence of the butterfly that the process seems less remarkable than one which goes on among the parasites in the tissues of a pig.

In the vertebrates the difference between the young and the adult is less surprising, and even the form of the embryo presents some analogy to that of the adult. Yet even the new-born child is quite sufficiently different from the mature man; and it is probable that, if we could view him with an eye wholly uninfluenced by knowledge of what he is going to be, we might realize more actively that the reproduction of form which marks a species is brought about through a long-continued series of changes. This series is in the form of a circuit, as it were, and any point in that circuit might be taken as a starting point; but it is perhaps most reasonable to consider it as starting with the egg and culminating with the production of the egg again.

In all the higher plants and animals we find sexual generation; that is, generation resulting from a union of the two sexes, male and female. Each sex is characterized by certain organs peculiar to itself, which gives rise to a certain organized product. This product, when united with the corresponding product of the other sex, results in the formation of a new individual of the same species. Thus, the female organism produces the egg or germ, and the male organism the sperm or spermatic fluid. When the

egg is fecundated by the spermatic fluid it becomes capable of developing into the young plant or animal. In flowering plants the male product is represented by the pollen which fecundates the germ and enables it to develop into the fruit. In many species of plants the male and female organs are found in the same blossom; in others they occur in different blossoms on the same plant; and in still others they are found on distinct plants. In most species of animals the female organs, or ovaries, which supply the egg are found in one individual, and the male organs, or testicles, which supply the spermatic fluid are found in another. In some of the invertebrates, however, notably the snail and the earthworm, ovaries and testicles are found in the same individual. Even in these species, however, the union of two individuals is necessary to reproduction, as the eggs of one are fertilized by the seminal fluid of another.

In the vertebrates the sexes are distinct, each possessing its characteristic generative organs, generally supplemented by accessory organs of generation which assist in the process, and occasion a difference, more or less marked, in bodily form. The various species differ in the structure of the male and female organs, the manner in which the sexual products are formed and discharged, and their union in the act of fecundation. In most fish the eggs are deposited by the female and then impregnated by the male. In the frog the eggs are impregnated at the moment when they are expelled. In serpents, lizards, and turtles the eggs are fecundated in the generative passages of the female, some species laying the eggs immediately, and others retaining them until the embryo is partly developed. In birds the fecundation takes place as soon as the egg is discharged from the ovary. This is true also in man and in mammals, but in them the fertilized egg is retained in the body of the female during the entire period of its development. A further discussion of the generative organs in man will be found in the **INTRODUCTORY CHAPTERS** (pp. 72-77). See also the articles **PARTURITION**; **PREGNANCY**; **SEXUAL DESIRE**.

RESORCIN.—A substance which occurs as clear, colorless crystals, easily soluble in water, and having a slight aromatic odor. It has much the same action as carbolic acid, being a powerful antiseptic and a local irritant. An overdose causes giddiness, deafness, salivation, profuse sweating, unconsciousness, and convulsions. In such a case the stomach should be emptied and washed out thoroughly with alcohol and water. Internally, resorcin is sometimes used to prevent intestinal fermentation; but its most common use is as a local application in skin-diseases, as eczema and psoriasis. Internally the dose is from one to two grains.

RESPIRATORY GYMNASTICS.—See **GYMNASTICS**.

RETINA, DISEASES OF.—See **EYE, DISEASES OF**.

RHEUMATISM, ARTICULAR.—This affection, which is known also as joint-rheumatism and as rheumatic fever, is greatly dreaded owing to its

painfulness and its tendency to recur. Distinction is made between two forms of the disease: the acute and the chronic.

Acute articular rheumatism, according to its principal symptoms, must be designated as an acute febrile affection, most probably caused by the action of bacteria, and in which the inflammation of various joints and the involvement of the heart are the most prominent features. The disease usually begins suddenly with a rise in temperature, and it may, in severe cases, lead to a stiffness of the entire body, rendering the patient as helpless as an infant. As a rule only a few joints are affected at one time. Not until later in an attack may the disease progress to other, previously healthy joints. In this manner most of the joints of the body may become successively attacked, some of them even repeatedly. It rarely happens that an attack of rheumatism is lodged in one joint only. When this occurs, as is sometimes the case when the disease is due to gonorrhea, the symptoms recede very slowly. The joints most frequently involved are those of the knees, hands and feet. They swell very suddenly, and become extremely painful. The slightest movement or pressure, even a shaking of the bed, intensifies the peculiar tearing and boring pains. At the same time some headache is present, together with profuse perspiration which smells remarkably sour. The urine is red in color and scanty in amount. After repeated fluctuations between improvement and aggravation the febrile symptoms recede, then the pains, and finally the swelling and stiffness of the joints. The duration of the disease varies. Sometimes it passes off in a week or two; in other cases it lasts for four to six weeks, or more. The average duration may be said to be about a month.

An especially severe form—which, however, is rare—is the so-called cerebral rheumatism, in which the febrile symptoms become prominent. The temperature may mount to 109° F., accompanied with delirium and convulsions, soon to be followed by unconsciousness. This disease terminates fatally in most cases.

The course of acute articular rheumatism, apart from the severe form mentioned in the foregoing, is usually a favorable one. It is, however, often complicated by a number of affections which aggravate the condition of the patient. The most important of these complications (which are due to the same poison which causes the affection of the joints) is infection of the heart, causing inflammation either of the pericardium or of the heart-valves. This results from the bacterial poison being carried from the joints to the heart by the blood-stream. Frequently no symptoms of this complication are present, and only an experienced physician is able to determine that the heart is implicated. The younger the patient, the greater is, as a rule, the danger of heart involvement, such danger being slight after the thirtieth year. Although some of these heart-affections are cured, there remains in many instances a permanent defect which may

give rise to subsequent disorders. An inflammation of the pleura is also to be considered as a possible complication.

Various other complications of articular rheumatism may occur. In addition to prickly heat, which is caused by the profuse perspiration, there may be other eruptive affections of the skin (such as nettle-rash), or hemorrhages from the skin may take place. In rare cases coarse nodules, varying in size from that of a millet-seed to that of a cherry-stone, may appear under the skin. These occur almost exclusively in children, giving rise to the condition known as *nodular rheumatism*.

The outbreak of articular rheumatism is very often preceded by inflammation of the tonsils; and it is even probable that tonsillitis is the primary affection. In children between ten and fifteen years of age, the disease is very frequently followed by ST. VITUS'S DANCE (which see). Acute articular rheumatism attacks principally persons between fifteen and thirty-five years of age. It occurs mostly in temperate zones, and is most frequent during the cold season and in months which are distinguished by changeable weather. In children the joint-symptoms are less marked than in adults, but affections of the heart are more frequent.

Among the causes which give rise to the affection, chilling of the body is of unquestioned importance. It is evident that individuals whose occupations expose them to rapid changes of temperature (drivers, farmers, sailors, etc.) are most liable to contract the disease. Overexertion and injuries to the joints also seem to prepare the soil for articular rheumatism. Acute articular infections may take place after certain infectious diseases, such as scarlet fever, blood-poisoning, pneumonia, cerebral meningitis, and gonorrhea. In these cases they are caused by the same bacteria which gave rise to the original disease.

Various modes of treatment have been employed in acute articular rheumatism, but all of these have been displaced by the salicylic-acid treatment introduced in the "seventies" of the nineteenth century. Salicylic acid is a remedy which, if administered in fresh cases, and at the beginning of the attack, produces excellent results. It is true that the drug occasionally causes disagreeable by-effects, such as nausea, ringing of the ears, etc.; but it has little harmful action on the heart, notwithstanding the assertion of "natural healers." Rheumatic affections of the heart are not a consequence of the salicylic-acid treatment; but, as already stated, they result from the same poison which causes the inflammation in the joints. It is to be borne in mind that the salicylates are not specific remedies. They are among the most useful drugs known, but they are not infallible; and when used injudiciously by the uninformed, they have been known to cause dangerous, even fatal, results. The weak heart of a rheumatic does not stand too much depression. Salicylic-acid combinations, therefore, can not be taken with impunity. They are dangerous unless taken under the

strict directions of a physician. Applications of warm water are usually not well tolerated at the beginning of the disease, but act aggravatingly. In cases of cerebral rheumatism accompanied with high fever, cold baths and cold packs are indicated.

If the joints are exceedingly painful, auxiliary measures may be necessary. These include packing the affected joints in wadding, and securing correct and restful position of the affected limbs by means of pasteboard bandages or splints. The temperature of the patient's room should be equable, not varying more than between 63° and 68° F. In the presence of fever, the diet should preferably consist of milk, mineral water, tea, bland soups, and eggs. It is an essential condition that the patient, even in mild cases, should remain in bed as long as possible, and not get up until a week after the pains have disappeared.

Prevention of many rheumatic conditions could doubtless be effected if individuals who follow the more dangerous callings would observe certain precautionary measures. These may be summed up as follows: Any one who becomes heated, whether by physical exertions or by staying in a hot room, should avoid resting in cold or damp air, or in drafts. He should keep moving until he is able to change his clothing, to dry himself, and to remain in a warm room. The opening of windows and doors, as practised by persons who work in front of a hot furnace, is to be condemned, as is also resting in cold or windy places after dancing.

Persons who have recovered from an attack of rheumatism should wear proper woolen or flannel undergarments, practise a sensible method of hardening themselves under a physician's directions (see **HARDENING**), avoid damp dwellings, and, if necessary, give up an injurious profession.

Chronic articular rheumatism may develop from one or several attacks of the acute affection, or it may occur gradually and insidiously in consequence of the repeated action of cold and dampness. Laundresses, scrub-women, and servant-girls are particularly exposed to this affection, which generally occurs after the thirty-fifth or fortieth year of life. The principal manifestations are limited almost exclusively to the affected joints, and consist of pain and stiffness. The pains may be so moderate that they interfere little, or not at all, with the patient's occupation; or they may be so severe that they render impossible the use of the affected limbs, and favor the development of permanent rigidity.

The course of the disease is always a protracted one. Improvements alternate with aggravations. The less severe the changes in the joints, the greater is the possibility of recovery. It is highly probable that what is known as chronic articular rheumatism is, in reality, a combination of several different affections. Little is to be expected from internal remedies. The celebrated lemon-cure does not accomplish any permanent results, and is frequently the cause of serious disorders of the stomach.

The external treatment is that which offers most hope. It is necessary to mitigate the pains, to strengthen and to accelerate the circulation of blood in the affected joints, to remove or reduce the swellings, and to preserve or regain the movability of the joints. A great many methods of procedure are at the disposal of the physician, who will decide upon the proper one according to the condition of the patient and the probable causation of the disease. Irritating or pain-allaying inunctions, applications of mustard-plasters or other blistering agents, massage, electricity, sanitary gymnastics, dry and moist heat—all are useful under certain conditions. Continued warm baths have proved very beneficial. Pure water may be used; or salt or lye may be added. In obstinate cases electric-light baths, hot-air baths, mud-baths, sulfur-baths, or sand-baths are serviceable. For patients who can afford it, a sojourn at a thermal spring may be useful. Among the better American resorts may be mentioned: Hot Springs, Virginia; Mt. Clemens, Michigan; and Hot Sulphur Springs, Colorado.

In an affection which is very often protracted, and which exhausts the patience of the sufferers, it is quite natural that a large number of remedies is tried, with or without the knowledge of the physician. Many a patient may even despair, and become the victim of impostors who extol "infallible" remedies and miraculous "cures." A great many secret remedies are on the market, "guaranteed" to cure chronic articular rheumatism. Many of these medicines contain active poisons (opium, colchicum, etc.), so that their use without a physician's directions is bound to cause serious results. Among other remedies may be mentioned the various contrivances (crosses, belts, etc.) said to produce an electric current when carried on the body. These are absolutely worthless. If they cause any electric current at all, it is so slight that it can have no curative action.

To prevent recurrences or aggravations of the affection, patients will do well to subject themselves to a rational and carefully practised hardening of their bodies (see HARDENING). Damp dwellings must under all circumstances be avoided. In some cases it may become necessary for the patients to change their occupations, or to move to another climate.

RHEUMATISM, MUSCULAR.—An affection characterized by muscular pains and by disturbances of motility. Pain is a signal that some part of the body is not in harmonious relation with its inner or outer environment. Simple pains, which are very prevalent, are usually designated as rheumatic, and ascribed to slight colds. In many cases, however, this assumption is a great mistake which often causes a serious affection to be overlooked, so that proper treatment is not procured in time. It is possible that pains which are rheumatic in character may be caused by diseases that have nothing whatever in common with rheumatism. Many neuralgic-like pains are present as a result of syphilis, alcoholism, lead-poisoning, sciatica, nervous affections, inflammatory conditions of muscles or of the periosteum (the

membrane which invests and nourishes the bones), incipient diseases of the vertebræ, and abdominal disorders of women (see also LUMBAGO). It is necessary, therefore, to have a physician determine the cause of the pains in order that the condition may be treated correctly.

Muscular rheumatism—so-called—is really a muscle-disease rather than a nerve-disease. It is a true *myalgia* (from Greek *mys*, “muscle” + *algos*, “pain”) in distinction from a *neuralgia* (from Greek *neuron*, “nerve” + *algos*).

Two forms of the affection are distinguished: the acute and the chronic. The principal symptoms in both forms consist in pains and disturbances of movement. In the acute form the affected muscle is usually slightly swollen, and sensitive to pressure; whereas demonstrable changes are generally absent in the chronic variety. For this reason, patients suffering from chronic muscular rheumatism are often wrongfully suspected of malingering. As a rule the disease attacks one muscle or one group of muscles, and the pain rarely wanders between unassociated muscles. Fresh cases almost invariably pursue a rapid course (a few days); but there are also obstinate forms which, although they cause only insignificant disturbances, are aggravated by changes in the weather. These patients are, therefore, often termed “human barometers.”

Muscular rheumatism is most frequently located in the muscles of the loins (in the small of the back), and is then called LUMBAGO. The affection has an acute onset, without any apparent cause. The patient suffers violent pains in the lumbar region, which are intensified by every movement of the trunk, such as bending, turning, or raising the body. Lumbago is very often brought on by lifting a heavy weight, or by rapid bending of the body. Other favorite seats of muscular rheumatism are the nape of the neck, the shoulders, the chest, and the head. Myalgia in the back of the neck may affect the muscles of one or of both sides. In the latter case the head becomes stiff and immovable; in the former, it is inclined toward one side. When the shoulder is the seat of rheumatism, the arm can not be raised. Rheumatism of the chest causes intense pain on breathing, coughing, and sneezing. Occasionally this condition is erroneously regarded as an incipient inflammation of the pleura, or intercostal pains. Rheumatism of the head, in which different muscles of the face and of the scalp are affected, causes headache. Moving the scalp (as by wrinkling the brow) is particularly painful. Rheumatism of the abdominal muscles is occasionally noted in wandering musicians.

The use of internal medicines (salicylic acid, etc.) at the beginning of the affection is usually followed by rapid recovery. Sweat-cures (steam-baths, etc.) are also of great service. Massage, correctly given, likewise removes the pain, often as if by magic. If the affection run a more protracted course, the remedies employed in the treatment of chronic articular rheuma-

tism are to be considered. These include embrocations, mustard-plasters, electricity, gymnastics, baths, etc.

RHUBARB.—The root of several species of *Rheum*, plants growing in Tibet. In the markets it occurs as hard, round, gritty pieces, brownish in color, and having a bitter taste. Rhubarb is a laxative which acts by increasing the flow of bile and stimulating the intestine; but it is apt to be followed by constipation, owing to the presence of tannic acid. For this reason it is a good drug with which to empty the bowel in irritative diarrhea. It is given in many preparations. The official rhubarb-pill contains three grains, and several pills may be taken.

RIBS, FRACTURES OF.—The action of violent force, such as a blow or a fall, may cause the fracture of one or several ribs, usually at the point of contact. Fracture of a rib is characterized by violent, piercing pains at the point of fracture, these pains being aggravated by the fact that the expansion of the thorax during respiration causes the ends of the broken bone to be rubbed against one another. This often gives rise to a tearing of the pleura situated on the inner surface of the ribs, and to an extravasation of blood into the chest-cavity. Thus the lung of the injured side is compressed, causing shortness of breath. Direct injury to the lungs, followed by coughing of blood, is a rare complication.

Fracture of a rib requires immediate examination and treatment by a physician. Tight strapping by adhesive plaster is a recognized form of treatment if there are no complications.

RICKETS (RACHITIS).—A disease of early childhood, characterized by softening of the bones, and consequent deformity. Although its manifestations are mainly evident on the skeleton, the bones becoming soft from insufficient deposits of lime-salts, the disease must be regarded as a constitutional one. It usually begins between the third and the sixth month of life, and may last until the sixth year; and it usually prevails in children whose parents also had the disease. The affection is caused primarily by lack of fresh air, and by unsanitary dwellings, uncleanness, and improper nourishment. Among the predisposing factors may be reckoned pulmonary, bronchial, and intestinal catarrhs. In a large number of cases no cause is apparent, with the possible exception of a lack of fresh air. The disease occurs in rich and poor alike, and more often in boys than in girls.

The early signs of rickets are: malaise, restlessness at night, perspiration (particularly about the head), diarrhea, and sometimes cough, or convulsions. It is a common error to attribute all these symptoms to teething. After a short time other characteristic evidences of the disease appear. Children who have already been able to sit up, or even to stand, refuse to remain in an upright attitude, and show an inclination to lie down. They cry when they are lifted up, especially if seized around the chest. Profuse

perspiration causes the hair to fall out; especially on the back of the head, where a bald spot soon develops. Along the front of the chest there may appear a double row of little knobs on the ribs (the "rachitic rosary"); and the wrists may appear swollen owing to thickenings of the ends of the bones of the forearms. The disease is characterized also by curvatures of the long bones of the body, such as the ribs, clavicles, thigh-bones, the bones of the upper and lower arm, the lower jaw, and even the bones of the pelvis. Such deformities are apt to persist until later in life; and under certain circumstances they exert a deleterious influence on the functional capacity of these parts and of the neighboring organs. The fontanels, or intervals between the bones of the skull, remain wide and soft, and the head gradually loses its round form and assumes a square shape. The vertebral column



FIG. 343. Rachitic child.

is bent, and the chest is flattened and pressed in at the sides, resulting in the so-called "chicken-breast" (see Fig. 343). This deformity of the thorax interferes with the activity of the lungs, and children thus afflicted are very prone to contract pulmonary diseases, which are not infrequently fatal. Dentition is impeded, the teeth breaking through the gums late and at irregular intervals. Rickets is also often accompanied by spasm of the vocal cords (spasmodic croup), and by general convulsions which constitute a serious menace to the life of the little patient. Intestinal catarrh, which may be marked by habitual constipation, is

present in varying degree, still further reducing the child's resistance. One of the noteworthy features of the condition is the markedly distended abdomen.

Suggestions for the prevention of the disease are discussed in the article on NURSING, NOURISHING OF. It is of the greatest importance not to give the baby milk which has been sterilized for more than ten minutes, and when the second year has been reached to administer meat-broths containing eggs, rice, or farina. Gruels made with milk may be given once or twice a day; and the child may occasionally be fed with scraped cooked meat, soft-boiled eggs, finely minced spinach, and apple-sauce. All so-called medicinal wines should be avoided, unless the attending physician especially recommends the use of a certain brand. Among the most important of all measures is the observance of extreme cleanliness. The child should be washed frequently, and should be given a daily bath in

lukewarm water. Plenty of fresh air, and bright, sunny, and well ventilated dwellings are likewise of the greatest importance.

If it be suspected that a child suffers from rickets, the symptoms should not be ascribed to teething, nor should any time be lost in useless rubbings with various household remedies. A physician should be consulted immediately, and his directions implicitly followed. Neglect of the condition will sooner or later result in deformed limbs, hunchback, chicken-breast, contractions of the pelvis (which in females may interfere greatly with childbirth), spasmodic croup, general convulsions, or pulmonary inflammations. Either of the last three affections may terminate fatally. Children who do not sit up voluntarily, should not be urged to do so; nor should they be placed on their feet until they do so of their own volition.

RINGWORM.—A general name for a group of diseases of the skin, called technically the *Tineas*, all of which are due to parasites consisting of various species of minute molds. These molds infest the hairy as well as the non-hairy parts of the skin, and although they grow best on the surface they sometimes acclimate themselves deeper in the skin. The most important forms are: favus, ringworm of the scalp, barber's itch, ringworm of the body, and chromophytosis, the last being a peculiar form associated with a yellowish discoloration of the skin.

The parasite of favus is known by various names, as the *Microsporon* or *Achorion*. It is a very contagious and chronic disease, chiefly of the scalp, but spreading also to other parts of the body, even to the nails. It is found in the United States chiefly among the poorer classes of immigrants, especially among Polish, Russian, and Italian children. The contagion is usually obtained from the head of some other child or from the fur of some domestic animal, notably cats and dogs, and is communicated by means of the fingers scratching the spores into the scalp or skin. The roots of the hairs are involved by the growth of the fungus; they fall out, and a scale forms which is made up of dead skin, of the bases of hair, and of pus. As the mold penetrates deeply into the hair-follicles it is very resistant to treatment, and is best eradicated by pulling out the hairs over the affected spot and then applying sulfur ointment or some other parasiticide. Within recent years radiotherapy has been used with excellent results in the treatment of this form of skin disease.

The ringworm-fungus is somewhat similar to that causing favus; in fact there is more than one species capable of causing ringworm. Its favorite sites are the scalps of children, although the smooth skin of the face and body is not immune. The characteristic feature of ringworm is its circular form, the name being sufficiently appropriate. Ringworm of the scalp, in the large majority of cases, occurs in children under fifteen years of age; and in from 85 to 90 per cent. of the cases it is due to what is known as the small-spored form of the disease. The patches may be single or

multiple, and oval to circular in form, of a slate-gray color, and dependent in size upon the length of time they have existed. Ringworm gives rise to bald spots on the head, which may be irregular in shape, and which are sometimes sharply marked off from the sound skin.

Ringworm of the body causes at first a faint pinkish, scaly eruption which later spreads in ring-like forms of a yellowish tinge. Barber's itch is still another form of the same type of disease, being caused by another of these fungi.

The chromophytosis is a fungus producing brownish to yellowish patches, and is usually very chronic but mild in type.

The method of treatment of the various forms of tinea all call for expert application. Most of the tineas are capable of cure, but if the disease has existed for a long time and the infection is wide-spread, it may take considerable time to entirely eradicate all traces of these fungi.

ROCHELLE SALT.—The colorless, transparent, crystalline tartrate of sodium and potassium. It is quite soluble in water, and has a slightly salty taste. Like the other saline laxatives it produces a watery movement. Its action is milder than that of Epsom salts, and its taste is not so disagreeable.

ROSIN.—A substance left after the distillation of turpentine. It is a brownish, clear, sticky, inflammable substance, and is used in ointments for its stimulating effect. Rosin plaster is largely used in surgical dressings.

ROUNDWORM.—See WORMS.

RUBELLA.—See GERMAN MEASLES.

RUBEOLA.—See MEASLES.

RUE.—The dried leaves of the *Ruta graveolens*, or common garden rue. It contains a narcotic oil which is a local irritant. Rue is sometimes used to control bleeding from the womb. An overdose may cause severe pain in the abdomen, vomiting, suppression of urine, and convulsions. In such a case the stomach should be evacuated, and soothing drinks given. The oil is given in capsules, in doses of from three to six drops.

RUNROUND.—A circumscribed, suppurative inflammation of the skin, usually on a finger; called also *felon*, or *whillow*. It is a condition which may lead to severe disturbances if neglected. As a result of a felon on a finger, the latter may become stiff, tendons may become gangrenous and be cast off, the infection may involve the forearm, and, in fact, life may be endangered by a general blood-poisoning. Runround is always the result of an injury which may be very trivial. A slight cut, or a scratch with a needle, nail, or bone may be the cause of the condition. The bacteria usually get lodged under the nail, where a localized abscess forms about the sheath of a tendon or in the membrane investing the bones of the finger (the periosteum). The pus being under great pressure, a felon is always attended by excessive throbbing pain, with heat and swelling of the finger. The pain may be so severe as to interfere with sleep.

No time should be wasted with embrocations, poultices, or plasters, but the felon should be cut as soon as possible. The dread, and consequent neglect, of this slight operation has often resulted in a stiff finger, or even in the loss of a finger. The operation is not at all dangerous, and under present surgical methods it is painless. It is only necessary to freeze the skin of the finger in order to cut it without pain. The throbbing pain disappears immediately after the operation; and if the latter has been performed in time the functional capacity of the finger will be retained.

RUPTURE (HERNIA).—The organs in the abdomen are enclosed in front by a firm, elastic wall of tissue (the abdominal wall) which is pierced by a number of openings for the passage of blood-vessels, nerves, seminal



FIG. 344. Inguinal rupture in the female.



FIG. 345. Inguinal rupture in the male.

ducts, etc. When these openings become abnormally enlarged, they permit the passage of various abdominal organs, particularly the intestines. The principal localities for the production of a rupture are the navel, the inguinal canal (an opening in the groin through which the seminal cord passes together with its vessels), and the femoral canal, which is situated in the upper portion of the thigh, and permits the passage of the large blood-vessels and nerves which supply the lower limb. The protrusion of portions of the intestinal tract in these localities produces a rupture which, according to its locality, is called umbilical, inguinal, or femoral (see Figs. 344-349). These forms must be distinguished from the so-called abdominal hernia, in which a large portion of the anterior abdominal wall bulges forward like a sac. This usually follows operations by the stretching of the resultant scar. In addition to the places mentioned, there are a

number of other localities where rupture may take place, but these are comparatively rare.

A **reducible hernia** is one which may be pushed back into the abdominal cavity with the hands. These ruptures usually appear during the day while standing or working, and slip back during the night when the patient goes to bed. In some cases, however, adhesions may take place between the gut and the hernial sac, and complete reduction is then impossible. Then again, the lifting of a heavy weight, or a paroxysm of coughing may cause a large loop of intestine to be forced down into the sac, and the contracted neck of the latter may prevent its return to the abdominal cavity, resulting

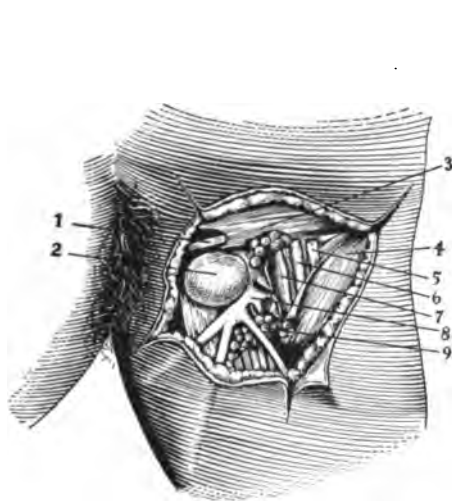


FIG. 346. Femoral rupture.

1. Round ligament; 2. femoral rupture; 3. external oblique muscle; 4. Sartorius muscle; 5. crural nerve; 6. femoral vein; 7. femoral artery; 8. saphenous vein; 9. lymphatic glands.

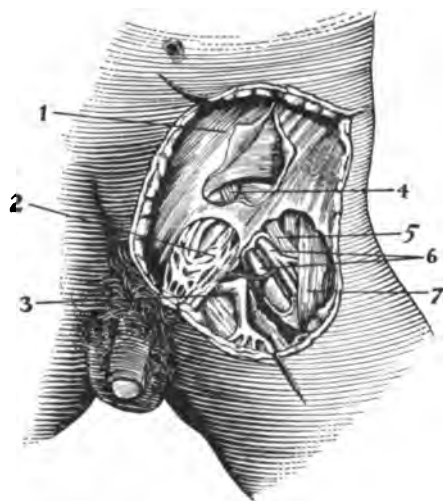


FIG. 347. Inguinal rupture.

1. External oblique muscle; 2. the rupture covered by muscle-tissue; 3. saphenous vein; 4. epigastric vessels; 5. crural nerve; 6. femoral vessels; 7. Sartorius muscle.

in the condition known as *incarcerated hernia*. This naturally constricts the lumen of the gut, and brings about a very dangerous condition which can be relieved only by means undertaken to remove the constriction. Nausea, retching, and pains in the abdomen are among the symptoms of this trouble; and the patient is unable to pass either gas or feces. If no relief is afforded, the vomiting continues, the abdomen becomes distended, and finally fecal matter is vomited. The patient rapidly declines, and death ensues.

The longer a hernia remains incarcerated, the more extensive the changes in the gut itself. Attempts at reduction, especially if carried out by the patient himself, also aggravate the trouble. In consideration of the unfortunate consequences which are known to attend this condition, it is advisable promptly to call in a physician, who, if carefully conducted attempts at manual reduction are not immediately successful, will resort to operative interference in order to reduce the constriction. Operation for these cases is

at the present day without danger, and is almost invariably life-saving. An unfavorable result is invariably due to extensive damage to the intestines during a long period of waiting.

Reducible hernias may also be treated by operative measures, by which the openings through which they protrude are closed. Otherwise it is necessary to wear a truss, the pad of which is placed over the opening after the rupture has been reduced.

From what has been said it is evident that every case of rupture must be studied individually in order that a definite conclusion may be reached as to the advisability of wearing a truss. These instruments should never be bought without proper professional sanction, as an improperly chosen, or improperly constructed truss harms rather than helps, and also increases



FIG. 348. Correctly adjusted truss for right-sided rupture.



FIG. 349. Correctly adjusted truss for rupture on both sides.

the dangers of incarceration. A truss should be frequently inspected and kept in good repair; and it is, therefore, advisable to consult a reputable instrument-maker rather than the peripatetic vendor or the newspaper advertiser.

In cases of inguinal and femoral ruptures, the truss must be adjusted in such a manner that the band or spring encircles the abdomen between the crest of the pelvis and the greater trochanter of the thigh-bone (see Figs. 348, 349); and it must be sufficiently snug to prevent the pad from being displaced in standing or walking. In the case of an inguinal hernia, a certain amount of motion may be permitted on sitting down, but in femoral hernia the truss becomes displaced thereby to such a degree that it must be readjusted on rising. If the hernia happen to protrude under the pad, the truss should at once be removed and the rupture reduced before the truss is again adjusted.

Trusses should always be removed at night in order that the skin, which is exposed to considerable irritation from the pressure of the truss, may

be afforded an opportunity to recover its tone. Before getting up at night to answer a call to nature, the truss should always be replaced, because straining at stool is very likely to bring about a protrusion of the hernia.

During warm weather the area of skin pressed upon by the pad of the truss may become red and inflamed. It is well to harden the skin as much as possible by sponging with cold water after removing the truss, and also before putting it on again. The irritating effects may also be moderated by placing a piece of thin flannel under the pad, and dusting the skin with powdered starch or talcum. In certain cases it may be necessary to leave off the truss for a few days.

In the cases of children, the trusses may effect a complete cure of the hernia; and for this reason they must be worn both day and night. For umbilical hernia in children, see **NAVEL-DISEASES**. A warning must be given against the employment of ointments, plasters, and other similar quack remedies. They have no effect whatever in contracting the opening through which the hernia is produced, and must be looked upon as mere fraudulent schemes to catch the unwary.

S

SACCHARIN.—A white powder derived from coal-tar, and occurring as small crystals. It is exceedingly sweet—220 times as sweet as sugar—and it finds its principal use in medicine as a substitute for sugar in diabetic patients, whose diet should be largely free from sugar and starch. Saccharin is usually made up into tablets, each containing one-half or one grain of the substance.

SADDLE-NOSE.—See **NOSE, CURVATURE OF**.

SALICIN.—A glycosid obtained from the bark of several species of willows and poplars. It is a white, bitter, crystalline powder, the action of which is due to the fact that it forms salicylic acid in the body. It is used for the same purpose as salicylic acid, but is much less irritating to the stomach. The dose is from five to forty grains, and it is usually given in capsules. See **SALICYLIC ACID AND ITS SALTS**.

SALICYLIC ACID AND ITS SALTS.—The salicylates occur in various plants, but the principal source of the acid for medicinal purposes is carbolic acid from which it is manufactured. Salicylic acid occurs in fine, white crystals readily soluble in alcohol, much less soluble in water. It is strongly antiseptic, and is an irritant. Taken internally it slightly increases the flow of urine and bile, and exerts a somewhat depressing action on the circulatory system and, in large doses, on the respiratory system. It reduces the temperature slightly in fevers; and it increases the

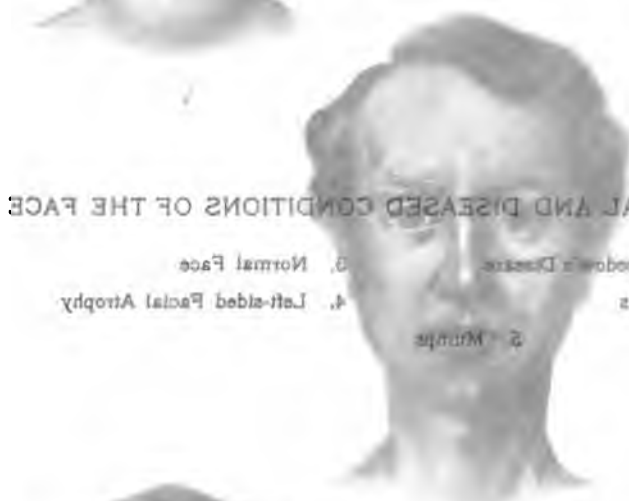


PLATE XVIII.—NORMAL AND DISEASED CONDITIONS OF THE FACE

1. Exophthalmic Goiter, or Basedow's Disease
2. Right-sided Facial Paralysis
3. Normal Face
4. Left-sided Facial Atrophy
5. Normal Face

PLATE XVIII. — NORMAL AND DISEASED CONDITIONS OF THE FACE

1. Exophthalmic Goiter, or Basedow's Disease

2. Right-sided Facial Paralysis

5. Mumps

3. Normal Face

4. Left-sided Facial Atrophy

FIGURE 1
FIGURE 2
FIGURE 3

FIGURE 4

of the face, the eyes of
a person with a normal
face are directed to the

center of the face, to the
mouth, which is usually

the center of the face.
In the case of a person
with a normal face, the
eyes are directed to the
center of the face. In
the case of a person with
a normal face, the eyes
are directed to the center
of the face. In the case
of a person with a normal
face, the eyes are directed
to the center of the face.



1



2



3



4



5

excretion of nitrogenous substances. The first effects noticed after a large dose are usually a buzzing in the ears, and some deafness. There may be headache, dimness of vision, a soft, weak pulse, with temperature below the normal, and possibly unconsciousness, paralysis, and convulsions. Nose-bleed, free sweating, and various skin eruptions have been noticed after its use. There is no known antidote for salicylic acid, the treatment consisting in getting rid of it as quickly as possible, and in treating the symptoms as they arise.

In acute rheumatic fever, salicylic acid acts almost like a specific, often controlling the symptoms in a remarkable manner. It is frequently used in lumbago and sciatica, and is recommended in gout. In quinsy and in rheumatic headaches it is very useful. Salicylic acid is used externally for its antiseptic and stimulating properties in certain diseases of the skin. Strong solutions are sometimes used as caustics for warts, corns, etc. The salts of salicylic acid are used internally much more frequently than the acid itself, as they are less irritating to the stomach and almost equally efficacious. There are several of these salts—sodium, potassium, strontium, etc.—sodium being perhaps the most commonly used. The dose is five to thirty grains. Salicin, aspirin, salophen, and salol all depend largely for their action on the salicylic acid which they contain or generate.

SALOL (PHENYL SALICYLATE).—A white, odorless, and almost tasteless crystalline powder, obtained by the action of heated salicylic acid on phenol, in the presence of certain salts of phosphorus. Salol is insoluble in water, slightly soluble in alcohol, but readily soluble in boiling alcohol and in ether and chloroform. It is used internally as an antiseptic in fermentative diseases of the stomach and intestinal canal, its action depending upon the large amount of phenol which it contains. Externally it is likewise used for its antiseptic properties. Salol is a dangerous drug in the presence of kidney-diseases. The dose is from 15 to 30 grains.

SALTS, ACTION OF.—The inorganic salts, as used in medicine, have effects on the body which can not be explained by their chemical reaction with the various tissues. These changes depend on a disturbance in the relative density of the fluids of the body, and are governed by recognized physical laws. An idea of the action of these principles will explain what occurs. If two fluids, holding in solution different amounts or kinds of salts, are allowed to come in contact, they will gradually mix, forming one uniform fluid. This is called diffusion. If two such solutions are separated by a permeable membrane, and one of them contains a salt, the process of diffusion will go on through the membrane, so that finally there will be an equal amount of equally salty fluid on each side of the membrane. This diffusion through a membrane is called *osmose* or *osmosis*. If the salt be of such a kind that it can not pass through the membrane, the fluid on the other side will tend to come through to the liquid containing the

salt, always tending toward a uniform solution. If the two fluids contain different amounts of different salts, some able to penetrate the membrane and some not, the result will depend on the difference in the concentration of the salts, modified by their degree of penetrating power. When that condition is reached where there is no tendency for a current to flow in either direction, the solutions are said to be *isotonic*.

The body is made up of innumerable little cells, each enclosed in a membrane, and for the most part bathed in a surrounding fluid, the lymph. Under normal conditions the contents of the cells and the lymph are isotonic; that is, balanced as far as possible in regard to the character and amount of the salts held in solution. When the lymph is changed in its composition, there results a disturbance in the balance of the lymph and the contents of the cells. Currents are, therefore, set up through the cell-walls; and an interchange of salts or fluid, as the case may be, takes place between the contents of the cells and the surrounding fluids. This illustrates the principle upon which salts affect the body from a physical standpoint. The absorption and excretion of the inorganic salts and a few other substances are partly explained by the osmotic relations between the fluid in the body and that outside of it, as the absorption of common salt from the intestinal canal through the walls of the gut. Certain cells are said to have a direct attraction for certain salts, regardless of these laws, so that their action is modified to some extent. A salt is a combination of two other substances, soda and chlorin, for instance, forming common salt. These substances act separately on the body, and are spoken of in this connection as *ions*, or component atoms.

SALT-WATER BATH, ARTIFICIAL.—A substitute for a sea-bath may be prepared by adding from 3 to 6 pounds of sea-salt to a warm body-bath of a temperature of about 65° F. For children a smaller quantity of salt is used. The bath may last for from six minutes to half an hour, and after the bath half an hour's rest in bed should be taken. The salt of the bath does not enter the body, but acts as a stimulant on the skin. Such baths are useful in many diseases, notably in scrofula, anemia, general debility, and in certain female disorders.

SALVES.—See DOMESTIC REMEDIES.

SANDALWOOD.—The fragrant wood of an evergreen Indian tree, the *Santalum album*. It contains a sweet-smelling yellowish oil, which has a burning taste and is somewhat irritating. The oil is used for its stimulating effect on mucous membranes in late stages of gonorrhea, and in bronchitis and asthma. The dose of the oil is five or ten drops, usually given in capsules.

SAND-BATH.—Such a bath should preferably be taken in a wooden tub. The sand is heated in large pans, care being taken that its temperature does not exceed 90° F., in order that it may not burn the body of the bather. A

thick layer of sand is then spread upon the bottom of the tub, and the bather, resting on this layer, is then thinly covered with sand, the chest, however, remaining uncovered. A blanket is thereupon spread over the tub. The patient must remain quietly in the bath until at least fifteen minutes after perspiration has begun. He is then taken out and given a cleansing bath of a temperature of about 75° F. In some cases the bath is followed by dry packs and massage. A cold sponge or towel should be applied to the patient's head while in the sand-bath.

These baths must not be given to patients suffering from cerebral or spinal diseases, nor to individuals with weak respiratory organs or calcified blood-vessels. The heart, also, must be quite sound. Sand-baths are indicated in rheumatism, gout, lumbago, kidney-diseases, and in female affections.

SAND-FLEA.—A small flea common in South America and in the West-Indies; called also *chigoe* or *jigger*. It is about half the size of the human flea. The female bores its way into the skin of the toes, feet, and lower legs of human beings, depositing its eggs, and causing violent pain and inflammation, accompanied by ulcers, suppuration, and gangrene. The parasite may be removed by a red-hot needle, and the wound cauterized.

SANGUINARIA.—The root of the bloodroot, or *Sanguinaria Canadensis*. Its active principle is an alkaloid known as *sanguinarin*. In large doses it is poisonous, causing vomiting and purging, collapse, convulsions, and death. The antidote is tannic acid. *Sanguinaria* is used very little in medicine, but is sometimes given in chronic bronchitis or as an emetic. The dose of the tincture is about twenty drops. When its emetic effect is desired, as much as a teaspoonful may be given.

SANITATION.—A sanitary house should be dry, sunny, well ventilated, and properly drained. City houses built in rows are usually restricted in plan and location by official regulations as to material, height, etc., while they are generally supplied with water, sewerage, street lamps, sidewalks, and facilities for removing ashes and garbage which are not to be had by the rural householder. The latter therefore must pay more heed to his surroundings, and is often at a loss how to provide water and drainage. He is also more influenced by local conditions than is a city resident, and he should, therefore, not decide hastily when selecting a home.

The proper planning of a house insures half of its success. It is therefore economical to employ an experienced architect. A layman can not judge material, and it is easy to "scamp" hidden work. It is inadvisable to "lump" the work to one contractor; and it is better to hold each mechanic responsible for his share. This is especially true of plumbing, where a small defect may do incalculable mischief. Then again, a well-built house can be warmed far more easily than one that is full of cracks and rattling windows. It is therefore wise to have double walls and floors, and to provide double windows and weather-strips to exclude cold air and avoid drafts.

Location.—With regard to the location, a southern exposure is desirable. The rooms which most need the sun are the kitchen, dining-room, nursery, and bathroom. Broad piazzas darken the interior, and too many shade trees foster damp. Evergreen trees should not touch the ground to collect dead leaves, create breeding-places for insects, and obstruct air-currents. Trees in rows should be so far apart as not to touch each other. Shrubbery will insure privacy and not restrict the view. The house should stand far enough from the street or road to avoid dust, yet not far enough to be isolated.

The Soil.—Ground-air has an important bearing on health. The interstices of the soil are filled with air which is apt to be contaminated by surface soakage and by the capillary attraction of the ground-water which varies in height at different seasons, as is shown by the height of the water

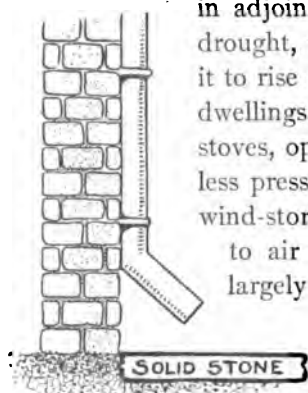


FIG. 350. Leader to carry rain away from foundation.

in adjoining wells. A heavy rain-storm occurring after a drought, when the ground-water is at its lowest, will cause it to rise rapidly and force the air in the soil upwards into dwellings. This movement is aided by the suction of stoves, open fires, and lamps, and by the fact that there is less pressure in the soil under a building than during a wind-storm outside, while frozen ground is more impervious to air than earth in a cellar. Ground-air is made up largely of gases of putrefaction and decomposition, especially carbon-dioxid, and it is decidedly unwholesome. It is therefore of vital importance that every cellar, even in houses built on gravelly soil, should have a cement flooring. If a house stands on made or marshy ground, or

near a watercourse, the cellar should be further protected by a water-proof lining made of bricks dipped in hot asphalt, with a layer of tarred roofing-paper, covered with broken stones and Portland cement. Such a barrier will be as impervious to damp as a ship's bottom.

Hippocrates said: "Pure soil, pure air, and pure water are the essentials of health." A dry site is therefore of first importance. Clay is wet; rock is cold and contains rifts that collect water; loam is good; but sand is better. In every case, however, provision must be made for surface drainage. It is not enough to dig a hole in the ground and set a box of stone or brick thereon and expect it to be habitable. An ordinary wall absorbs moisture by capillary attraction, like a candle-wick or crash towel. Place a brick in a pail of kerosene and it will burn like a torch. The ground around houses should be graded so as to shed surface water from the foundations. Leaders should not empty on the earth close to the wall of the house, but should be extended at least ten feet away to avoid creating damp (see Fig. 350).

Old and New Houses.—An old house is apt to be damp and out of repair; yet if the frame is solid it may be enlarged to advantage. Alterations, however, are usually costly. In such buildings one should beware of disused cesspools, old wall-papers, and damp cellars, and thoroughly fumigate and whitewash as a precaution. New buildings shrink as the woodwork dries, and cracks are caused by settling. Tons of water may be used in making mortar, and this water must evaporate before the building is dry. The old proverb is wise: "The first year for your enemies, the second for your friends, the third for yourself."

The Back Yard.—The back yard should be kept neat and sightly, and should not be made a dumping-ground for rubbish and litter of all sorts. Low spots that collect rain should be filled up and sodded; and vines and at least a few flowers and shrubs should be planted to give a pleasant outlook. Garbage should be removed systematically, and should be kept in tightly covered cans until taken away. Tea leaves, potato peelings, bones, and similar scraps can be burned in small quantities *under* the grate-bars of the kitchen stove without causing any odor, and give as good results as the patent carbonizers attached to smoke pipes.

Verandas.—Many people nowadays not only take their meals out of doors in fair weather, but even sleep there. A good veranda is therefore equivalent to another living-room. If enclosed with glass at one end it makes a sun-parlor or conservatory. Most plans for country houses fail for lack of a good kitchen porch where servants can prepare vegetables and sit between meals and on pleasant evenings.

Cellars.—Thoreau says in his *Walden, or Life in the Woods*: "The house is still but a sort of porch at the entrance of a burrow." Primitive man dwelt in caves, and the first colonial dwellings were simply holes in the ground, roofed over like the sod houses in the West. In former days houses had no cellars, but were built directly upon the ground and banked all around with manure in winter for warmth. A hole was dug in a side-hill, and walled in to store roots and vegetables, while a spring house or the well served as a refrigerator. Every dwelling should have a cellar to contain the heating-apparatus, store fuel, and for comfort's sake. The cellar should have windows on opposite sides which can be opened in all kinds of weather for ventilation. Coal-bins should not be so high as to obstruct free circulation of air. Cellar walls should be whitewashed every spring and fall, and the ceiling should be plastered and all openings for soil- and waste-pipes closed with cement to prevent cellar air from entering living-rooms. The floor should be covered with six inches of broken stone, over which should be laid three inches of Portland cement (see Fig. 351). This will prevent "sweating," which would result if the cement were laid directly upon the cold ground. The cellar drain should not connect with the house drain unless there is an intercepting trap fed from some certain source

of supply, such as a refrigerator waste-pipe, or tank overflow, or a back-pressure valve trap to prevent sewage from backing up and flooding the cellar. It is not desirable to locate plumbing fixtures in cellars, as they are apt to be neglected so that their traps dry out. Ashes and garbage should never be stored in cellars. Refrigerators should not connect direct with the house drain, but should empty into a metal pan or into a sink in the cellar.

Plumbing.—The essential principles of perfect plumbing are (1) good materials, (2) careful workmanship, and (3) thorough ventilation of all drains, traps, and fixtures. Formerly light-weight soil- and waste-pipes were used, often cracked or full of sand-holes. Now nothing but “stand-

ard” iron pipe is permitted, which has been tested by water-pressure, and which has deep hubs so that secure joints can be made. Galvanized iron is also used for waste-pipes with screwed joints, which greatly simplify the work, and ensures that the pipes are gas-tight. When the house is completed the whole drainage system is tested by water- or air-pressure or with oil of peppermint as a guarantee that everything is safe.

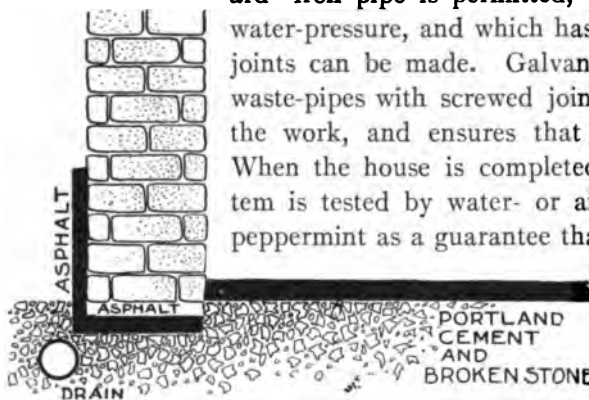


FIG. 351. How to make a dry cellar.

Formerly all drains and soil-pipes, and most plumbing-fixtures, were boxed-in so as to be inaccessible, thus affording spaces to harbor vermin

and foster decay and damp. Now exposed plumbing is the rule, while wooden wash-tubs, tin-lined baths, and iron slop-sinks have been superseded by porcelain or enameled-iron fixtures which are clean and sweet. A model tenement house of the present time is more sanitary in this respect than the millionaire's mansion of twenty years ago.

Next to durability of materials comes quality of workmanship. The plumber of former days was a mere tinker with neither skill nor training; now he is a highly-paid capable mechanic and his work is superior. All soil- and waste-pipes are concentrated as much as possible, and are run in straight lines with the fewest possible bends. All traps are placed close to fixtures, and every fixture must be trapped separately except in the case of kitchen-sinks and wash-tubs in moderate-priced flats and tenements. Water-closets must be flushed by cisterns, and not by direct pressure; valve closets for servants' use are tabooed.

House Drains.—Whether the house drain should be of cast iron or earthenware is an open question. It is preferable to have a cast-iron drain carried with a good fall (one in sixty) along the side-wall, rather than to have an underground tile pipe which is liable to crack or be damaged by roots

of trees, rats, etc. In good practise only iron pipe is permitted within doors, and tile pipe outside the building. The iron pipe should be carried three feet outside the foundation walls in order to avoid any risk of breakage from the building settling.

The Laying of Drains.—The laying of underground drains is usually entrusted to unskilled laborers; yet it should be carefully done under competent supervision. Iron pipe is preferable indoors. If tile pipe is chosen for economy's sake, a ditch should be dug two feet wide so as to give ample room for action; the bottom should be beaten hard, and have a grade of one foot in sixty, with a slot to receive each hub. The cement should fill the entire circle of the hub, and after laying each length of pipe the interior should be scraped clean with a piece of rattan having a swab at one end to remove all obstructions.

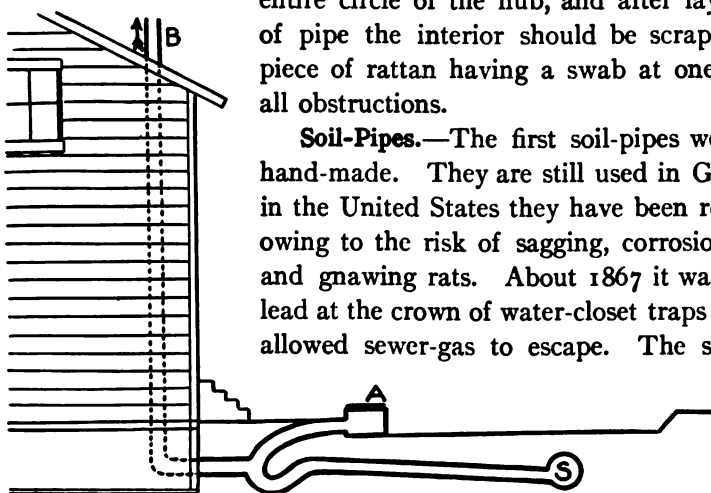


FIG. 352. Ventilation of drains.
A. Box admitting air into drain; S. Sewer.

reached only as far as the bathroom or second floor; but upon this discovery be-

ing made they were extended to the roof, at first of small size, later of full size, and finally they were enlarged to five and six inches and the end divested of cowls and "return-bends" which tend to close the pipe by the freezing of the condensed moisture.

Ventilation of Drains.—Even if house drains are of good material and properly connected, there is still risk of the traps or fixtures losing their seal by evaporation or siphonage, so as to permit the entrance of sewer-gas into living-rooms. A thorough circulation of air is therefore necessary throughout the entire drainage system, so that in case of a leak or accident only diluted foul air can escape. To secure such ventilation a running trap is placed upon the main drain between the house and the sewer or cesspool, with a fresh-air inlet from just inside the trap extended to the ground-level and ending in an open box covered by an iron grating which should be kept free from dirt. The air entering at this opening will circulate through the whole drainage, and pass out at the roof so as to ventilate every pipe and drain (see Fig. 352).

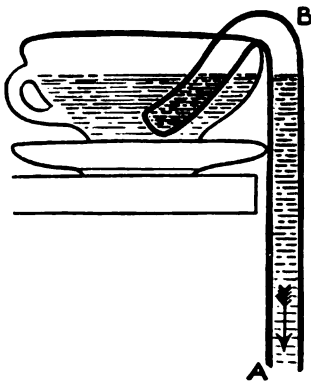


FIG. 353. Siphonage illustrated.

When suction is applied at A, the cup will be emptied by the vacuum created at B and the atmospheric pressure upon the water in the cup.

Water-Traps.—Water-traps have been used for many years in chemists' laboratories to prevent the passage of gases, and they are thoroughly reliable. They depend for security upon a water-seal, perhaps only an inch or two in depth. Since this will soon evaporate in warm weather or freeze in winter, the supply must be replenished at intervals. Therefore, any plumbing-fixture which is not in constant use should be cut off. Siphonage is due to the pulling action of one trap upon another, or of a column

of water emptied into a soil- or waste-pipe and passing by a branch trap on a lower floor. In either case the water-seal in the second trap is forced or the trap partly emptied and its efficiency destroyed. This action can be prevented by attaching a "back-air" pipe to the crown of the trap and carrying the same above the roof. For an explanation of siphonage, see Figs. 353, 354.

Valve traps are not sanitary, except to resist tidal pressure. Most "bottle" or pot traps are miniature cesspools which collect grease and filth; patented devices are usually makeshifts, and are not permitted by health-boards in large cities. The "Sanoz" trap is an exception to the rule, and has been officially approved and used in public buildings (see Figs. 355-359).

Water-Closets.—The best plumbing fixtures are cheapest in the long run. The siphon-jet water-closet is absolutely self-cleansing, but it consumes a great deal of water. The low cistern is almost noiseless, which is advantageous in many situations. The wash-out closet requires attention to keep it sweet and clean. The long-hopper soon gets foul and is out of date; whereas a short-hopper with an enameled iron trap costs little and is economical and sanitary; it is especially adapted to servants' use. When houses are not occupied during the winter, the water-closet traps should be sponged out and filled with kerosene or glycerin to prevent freezing.

Wash-Tubs.—Wooden wash-tubs are very unsanitary, as they rot, leak, and become foul and slimy. Slate and soapstone are hard to keep

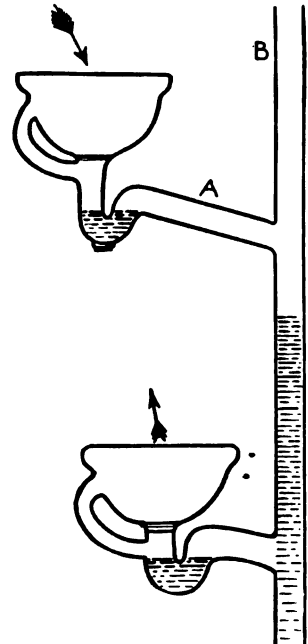


FIG. 354. Siphonage illustrated.

The principle of Fig. 353 applied to water-closet drains.

tight. Porcelain and enameled iron are expensive, while Alberine stone is economical and easy to keep clean.

Kitchen-Sinks.—Porcelain-lined sinks are very attractive and clean, but they readily chip or “craze”; and most housekeepers prefer a plain black iron sink which costs far less and can be kept reasonably clean.

Refrigerators.—A refrigerator should be of ample size and lined with enameled tiles or glass so as to be absolutely non-absorbent. There should be no wood in contact with the ice, nor should milk, butter, or other food be placed in the same compartment with the ice. There is no saving in wrapping ice in newspapers or woolen blankets to prevent rapid melting. Articles likely to taint other foods should not be placed in the refrigerator; and the latter should be scalded frequently and the shelves taken out and aired. The waste-pipe for melted ice in particular needs frequent cleans-

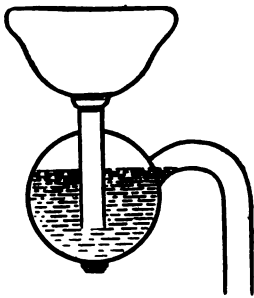


FIG. 355. Bottle trap.
(A miniature cesspool)

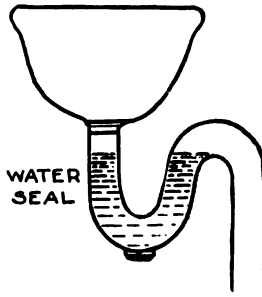


FIG. 356. "S" trap.

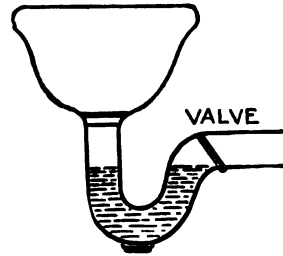


FIG. 357. "Sanoz" trap.

ing. Water placed in bottles in the ice is much more palatable than iced water. A better plan is to provide a square box lined with galvanized iron with a coil of supply-pipe in the bottom on which several days' supply of ice can be kept—sufficient to cool the drinking-supply without contact with the ice. Such a box can be made for sixty dollars, and it will soon pay for itself by the saving in labor and ice. A refrigerator should never connect direct with a drain or sewer, but should empty into a pan or over a sink in the cellar, with the end of the waste-pipe turned up to form a trap. In planning kitchens most builders forget to provide a suitable place for the refrigerator, where it can be filled from out-doors and at the same time be easily reached without going outside or down-stairs. It should never be placed where it is very warm; nor in a dark corner. (See Figs. 360, 361.)

No article of food taken from a sick-room—such as jelly, custard, fruit, etc.—should ever be stored with other foods, nor eaten by other persons than the invalid for whom it was prepared; and all remnants should be destroyed. A wooden box placed outside the window will, in cold weather, serve as a substitute for a refrigerator. It can be protected in front by a curtain or by sliding glass doors (see Fig. 362).

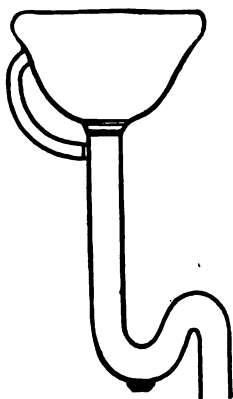


FIG. 358. Trap too low down.

Bathrooms.—Every bathroom should connect with the open air by a window, and not be lighted by a ventilating shaft or skylight. Set wash-basins are not desirable in sleeping-rooms. The waste-pipes collect soap and grease, and should be cleansed every month or so with potash (lye) dissolved in boiling water. Odors about plumbing fixtures can not be cured by ordinary disinfectants which are usually only deodorizers; and soap and hot water will serve equally as well in most cases. If there are defects in drains, patches on soil-pipes, or foul traps, it is better to call in a good plumber and have him test the whole drainage system to find out what is wrong. It is also well to remember that a "cheap" plumber is

usually a bungler. Good work is always most economical.

Cesspools.—There are two kinds of cesspools, tight and leaching. If the soil is porous and there are no near-by wells (one hundred feet is a safe distance), the latter form is preferred as it saves pumping out. But the most absorbent soil will in the course of time become choked with grease, and the cesspool will fill up so that a new one will have to be dug. On the other hand, a tight cesspool will have to be pumped out at short intervals, which is a costly and annoying process. Therefore, some other form of sewage disposal is to be preferred on sanitary as well as on economical grounds; and it will ultimately pay for the extra outlay.

A good substitute for a cesspool is provided by digging a trench, say 100 feet long, 2 feet deep, and equally wide; lay a 4 inch tile drain with open joints, and fill in around it with cobblestones and large gravel of the size of eggs. The top is to be left open, and the fresh sewage discharged into the drain until it fills up to the top. In a short time it will soak away into the soil and disappear. If any odor is perceptible, a pound of copperas should be dissolved in a pail of hot water and emptied into the drain.

Sub-Surface Irrigation.—This method of sewage disposal has been widely advocated by Col. Waring and other sanitary engineers. Under favorable conditions it gives good results; namely, where there is porous soil or one that is thoroughly underdrained. In a tough clay soil such drainage is absolutely necessary. The sewage is first collected in a small brick cesspool which serves as a settling-basin, and which is supplied with a tip-over

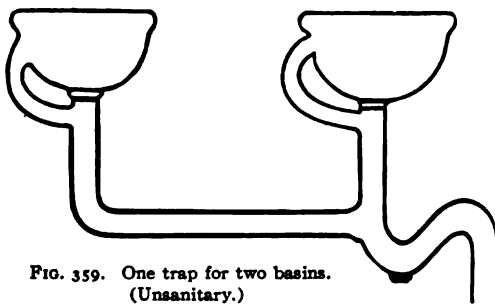


FIG. 359. One trap for two basins. (Unsanitary.)

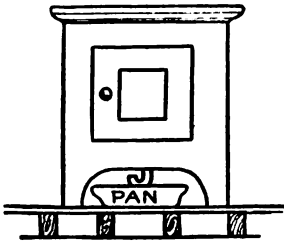


FIG. 360. Refrigerator emptying into pan on floor.

flush-tank or siphon which discharges intermittently and spreads the liquid sewage broadcast through a gridiron of open-jointed tile pipes covering half an acre of ground and laid just below the surface, the joints being covered with hay or tarred paper to exclude dirt. The air penetrates through and oxidizes the sewage; the roots of the grass or other vegetation also soak it up, and what remains after filtering through the soil comes out as almost clear water and is quite harmless. The pipes do not freeze in winter, nor are they seriously affected by frost; but usually they have to be relaid every few years to preserve a uniform grade. If the ground is nearly level, and there are plumbing-fixtures in the basement, as is usually the case, it will be impossible to keep the pipes sufficiently close to the surface of the ground to use this method of disposal, and in this case the old-fashioned cesspool may have to be utilized.

For institutions or small settlements the septic tank and filter-beds may be recommended. The former is simply a tight cesspool in which the sewage is kept in darkness from six to twelve hours so as to be exposed to the action of anaerobic bacteria which destroy about one-half of the putrescible material. It is then turned on to a series of filter-beds formed of coke, crushed stone, or coarse sand and gravel, and allowed to settle for twenty-four hours, each filter-bed being used in turn. Through the action of aerobic bacteria, the effluent will be so purified as hardly to be recognized, and can be discharged into an ordinary stream. This method of sewage disposal is the most promising now in use.

A good plan for disposing of the sewage of a small house has been devised by Dr. H. B. Bashore. A series of galvanized-iron gutters (old leader pipes in short) are arranged four feet apart and perforated with nail holes, so that when fed from a kitchen or other waste-pipe the sewage is distributed evenly over a garden or field, thus providing an excellent fertilizer at slight expense and without annoyance.

Earth-Closets.—Where water-closets can not be provided, the earth-closet is an admirable substitute for the old-fashioned privy. All that is necessary is to have a cemented vault, and to provide a box full of dry loamy soil or sifted ashes, with a little chlorid of lime to be used systematically. In this way no odor will be created,

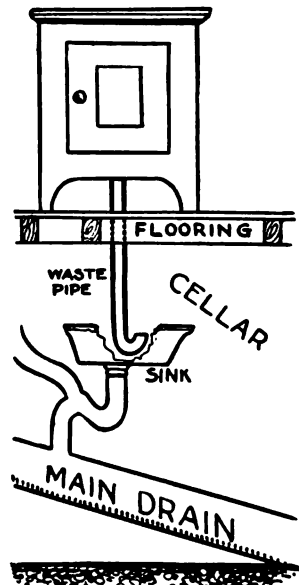


FIG. 361. Refrigerator emptying into sink in cellar.



FIG. 362. Winter refrigerator.
Box fitted into kitchen window,
either in place of, or behind,
lower sash.

and the fluids will be soaked up so as not to furnish a breeding-place for flies or mosquitoes. There should be an opening at the side of the vault to clean it out at intervals. A better plan is to have a substantial wooden box, coated inside and outside with asphalt paint, and supplied with handles by which it can be drawn out and carted away. For location indoors, a couple of galvanized pails with a box of sifted earth or ashes (the pails to be used in succession) will give entire satisfaction.

Water Supply.—Most persons consider a spring a safe source of supply for drinking-water, but it should be remembered that spring-water is no better than its source, the ground-water, and that may be seriously contaminated. Mountain streams should be traced to their source to insure that they are not polluted by privies, stables, or rotting vegetation. Eternal vigilance is the price of sanitary safety. In lakes and ponds the deeper parts are

purest, and the larger the volume of water the greater the dilution. No large river that receives the drainage of successive towns and villages can be trusted for drinking purposes without filtration. When rain or melted snow sinks into the soil, it passes down until it reaches clay or hard-pan, where it collects in pools or streams which spread for miles and flow like rivers, following the dip of the underlying strata. As surface water passes downward, the soil acts as a filter and strains out floating dust and other refuse found in settled communities. It is cooled by contact with masses of ice or frozen ground, and this is why spring- or well-waters are so palatable. If the ground is porous, the process of purification is rapid. In a clay soil it is slow; and surface water collects in pools, stagnates, gets full of rotting vegetation, and fosters malaria.

In most places it is only necessary to sink a well twenty or thirty feet to obtain an ample supply of water. On Long Island the underground streams are even nearer the surface, while in other localities tube-wells have been driven a thousand feet without striking water. Dr. Roberts of the New York Board of Health states that at Memphis the water in driven wells, under two hundred feet of clay, was contaminated by kerosene-oil spilled on the ground. This shows how easily shallow wells may be polluted if the ground is contaminated by the soakage from barn-yards, cesspools, and privies.

Wells are most likely to be contaminated by surface leaching, and therefore the upper part should be constructed so as to exclude rats, frogs, snakes, decaying leaves, and soakage of rain and melting snow. The well should

be lined for some distance down with large tile pipes carefully cemented, provided with a heavy flagstone cover, and the whole roofed over.

Cisterns.—Rain-water is a valuable addition to the household supply. A roof of 30 x 40 feet will, even in a dry year, supply five barrels a day—enough for an average family. Impurities are greater in town than in the country, but by letting the first rainfall run to waste, and excluding dust and leaves, cistern water may be made palatable; while it is especially suited for laundry use. A cistern should be of sufficient size to hold a month's supply. It should be covered with a fine wire-netting to exclude insects and dust, and it should be impervious to surface-water. Deep cisterns are coolest, and the water tends to purify itself as the sediment is deposited and the impurities oxidized.

Domestic Filters.—An ordinary filter is a delusion and a snare, unless it can be frequently reversed and thoroughly cleansed. It is simply a mechanical strainer, and not only serves no useful purpose, but is an actual menace. It is like having a cuspidor that is never cleaned; it only collects filth and propagates disease-germs.

Heating-Apparatus.—Every house, however small, should have an open fire for comfort and as an aid to ventilation, even though most of the heat flies up the chimney. Stoves save fuel, and will warm halls or connecting rooms or rooms on different floors by means of a "drum"; but they will not heat a whole house as well as a furnace. A "Galton" or "Jackson" ventilating grate is the best appliance for single rooms, serving at once as an open fire and as a closed stove. A furnace will warm several rooms as easily as one, and is more economical of fuel and less troublesome than several stoves. The important consideration is to secure a furnace that is large enough to serve without keeping a big fire, or heating the fire-pot red-hot, and thus "burning the air" as was formerly the rule in most dwellings. The fresh-air supply should never be shut off entirely even in zero weather. If the air seems dry, a wet towel should be hung in front of the register when the water will rapidly evaporate. Every room should have a chimney-flue; otherwise it will be as difficult to force hot air to enter it as it is to pour water into a bottle that is already full. So, also, warm air will rise to the upper floors, and not heat basement and halls. The heating-flues for lower floors should therefore connect direct with the furnace-dome, so that each can get its share of the heat. To warm an entrance hall is difficult on account of the upward "pull" of the staircase and the inrush of cold air. Storm-doors and a vestibule should therefore be provided, and the register should be placed *under* the stairs. Registers should be located on inner walls, and never on floors, as they collect dust, matches, etc., which may cause fires. If there is a ventilating skylight in the roof it will be easier to warm the house, as circulation of air is essential, and without such an arrangement the air will stagnate on upper floors. With an open fire one

can sit in comfort with the thermometer at 50° F., whereas with stove or furnace heat 70° will seem necessary.

Furnace.—The furnace should be located near the cold side of the house on account of the wind-pressure which makes it difficult to warm rooms facing northwest. The fresh-air supply should be taken from the same side, and the end of the box should be raised five feet above the yard level to avoid drawing in ground-air (see Fig. 363). If it opens under a veranda, the space around it should be kept free from leaves or other sources of impurity. The cold-air box should be tight, and should preferably be made of galvanized iron. It should have a fine wire-netting at the end to keep out dust, and it should be cleaned every year. For large buildings a steam or hot-water apparatus is preferable to a hot-air furnace. It is claimed that the former is less troublesome, and that it warms every room

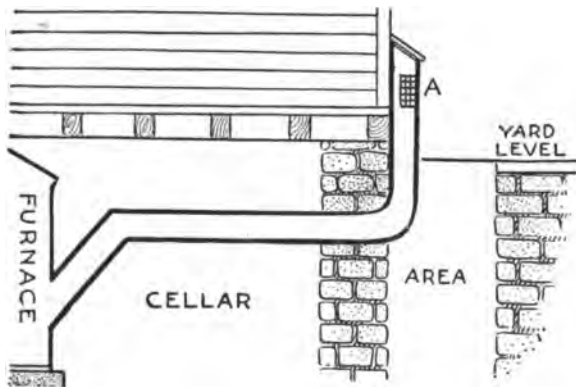


FIG. 363. Cold-air box for furnace.

Air enters at A, and box is raised five feet above yard level.

regardless of exposure or how low the temperature. It costs more to install, but is more durable than a furnace. The objection to steam-heat is that it is difficult to regulate in mild weather; while with the direct system the radiators are unsightly and warm the same air over and over again, and there is no ventilation. If the radi-

ators have an air-supply from outdoors, they are liable to freeze in winter. The indirect system, by which fresh air is admitted to steam-coils in the cellar and then carried through flues to every part of the house, serves very well, though at greater expense. Hot water has the advantage of maintaining a more even temperature without overheating on mild days in spring or fall. The pipes are larger than steam-coils, and cost more to install, but the results are sanitary. The direct and indirect systems are often combined, and give entire satisfaction. The problem of warming is largely a matter of expense; but the saving in doctors' bills and in increased mental and physical efficiency more than compensates for the outlay required to provide a really good heating apparatus.

Many persons imagine that the fire-box of a furnace connects with the hot-air flues, because smoke, coal-gas, and fine dust from ashes sometimes come through the registers. In reality, however, the smoke and dust escape into the cellar when the furnace doors are opened to put on fresh coal, are sucked through cracks in the cold-air box, and then drawn up through the

registers. Few persons understand the mechanism of a furnace, because it is boxed in with brick or galvanized iron so that the interior parts are never exposed to view. Out of sight is out of mind. An ordinary furnace consists of a fire-pot of cast iron, lined with fire-brick, with a wrought-iron dome or cover set in a groove filled with sand so as to permit of alternate expansion and contraction of the metal when heated and cooled. This is enclosed in galvanized iron or brick, with a small intervening space. Cold air is brought from outdoors through a box of wood or galvanized iron, and after being warmed by contact with the fire-pot is carried up through the flues constructed in the walls of the house. These flues open into living-rooms and halls through registers which can be closed by valves. To increase the efficiency of the furnace, various designs have been made to enlarge the heating-surface by the addition of flanges or vertical ribs with deep corrugations which are sometimes undulated, and into which the gases and smoke penetrate, thus increasing the heating-surface very materially. Merely enlarging the space between the fire-pot and the outer casing would admit too large a volume of cold air in proportion to the heating-surface. Only the inner stratum of air would come in contact with the surface of the fire-pot, and the outer stratum would scarcely be warmed at all. The heavier the casting and the more numerous the convolutions, the greater heat will be evolved. Another device which has proved successful has been the addition of an elaborate system of pipes—upright, horizontal, circular, conical, and cylindrical—which can be connected or disconnected at will, and which carry smoke and heated gases into the chimney. Most modern furnaces combine both features, being constructed with a fire-pot flanged and corrugated to increase the heating-surface, and having also a complication of smoke-flues so as to create direct and indirect drafts.

When the fire is started it connects directly with the chimney by a short cut, or direct-draft damper, as slightly warmed air can not be expected to be drawn through a round-about system of flues. After the chimney is warm enough to maintain a permanent draft, the direct-draft damper is closed, and the circuitous route through the system of pipes is utilized, bringing the entire heating-surface into action.

In addition to these provisions for controlling a furnace fire, sliding doors are provided in the upper and lower doors of the fire-pot. A check-draft damper is also placed in the main smoke-pipe or in the indirect-draft pipe to control the entrance of cold air. Various devices are employed to make this action automatic so that a furnace will become self-regulating. A furnace gives the best results and is most saving of fuel if the fire-pot in very cold weather is kept filled as high as possible, with the drafts regulated so as to keep a steady fire. A large heating-surface kept at a moderate temperature will prove far more effective than a smaller fire-box intensely

heated by forced draft, which is wasteful of fuel and liable to crack the fire-pot.

The Kitchen Range.—A range differs from a stove in three features. The main object of a stove is to create warmth, while a range is designed to cook food and to heat water for household purposes. The grate-surface is made as large as possible, and is supplied with movable lids so that the red-hot coals can be uncovered for broiling and frying. Other openings serve to admit pots and kettles. These methods of cooking require a bright and hot fire, whereas baking demands a steady and uniform temperature. The oven must therefore be heated on all sides, and this is accomplished by carrying the smoke and hot gases from the fire-box around the oven before they enter the chimney. If there are separate ovens two smoke-

pipes are provided which join before entering the chimney. The fire-box is made oblong and deep to hold plenty of coal, and is lined with fire-brick.

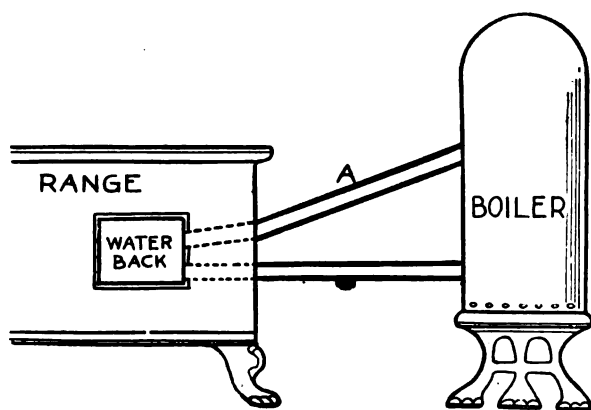


FIG. 364. Connections between kitchen boiler and water-back. Hot water flows into boiler through the pipe A, which must have an upward grade.

The water-back, an iron box corrugated on the side next the fire to increase the heating-surface, has two pipes connecting with the kitchen boiler through which cold water enters and, when warmed, flows back into

the boiler and then circulates through the house to the bath-room, laundry, and butler's pantry. In some ranges the water-back is divided lengthwise by a diaphragm which separates the inflowing cold water from the out-flowing hot stream, thus greatly increasing the heating capacity of the range. A brass water-back is more expensive but no more serviceable than one of iron. The water-back is sometimes placed in front of the range, but it acts just the same in either case. A coil of heavy copper tubing is sometimes used instead of cast iron. (See Fig. 364.)

Unless the range is kept free from ashes and clinkers, it will be impossible to broil chops and steaks. Clearing the grate-bars with a poker is a slow and annoying process. The "Smythe" or "triangular bar" grate has three-sided bars which revolve and interlock, and are turned in opposite directions by a handle operating cog-wheels, thus removing ashes and clinkers with little dust and trouble. Other forms of grates have been devised with the same object. It is highly important to keep the grate

clear, as otherwise the bars may melt with the excessive heat, or clinkers may stick to the fire-bricks. The pan should also be kept free from ashes if a good fire is to be maintained.

The best range will not work if there is a poor draft. This may be due to a crack in the oven door or top; or a broken cover or open joint in the smoke-pipe may admit enough cold air to check the draft even if the chimney-flue is ample. The latter should not be less than 8 x 10 inches and, better still, 8 x 12 inches. If a broiler, laundry stove, or ventilating hood connects with the range-flue, it will interfere with the draft unless fitted with dampers which can be closed on occasion. The hot-air flues around the oven collect dust and fine ashes, and thus check the draft; they should therefore be carefully cleaned. If the smoke-pipe from a range is connected with the chimney near the ceiling, the draft will be better, but the room will be uncomfortable during warm weather.

Water can not be warmed without consuming fuel; and if plenty of hot water is required for washing and bathing, a good fire must be kept up in the range. Water may be required in the laundry when a low fire is desirable in the range, as in summer or between meals. It is therefore desirable sometimes to have the boiler heated by the laundry stove to prevent friction between cook and laundress. A very small stove will be sufficient for this purpose, and can be used also for heating irons, etc.

To keep the boiler hot, the circulation through the water-back must be rapid, and the connections must be properly made. The return-pipe from the range to the boiler should have an upward grade, as hot water always tends to rise. The inlet-pipe which carries the cold supply should descend a little from the boiler so that the sediment can be easily removed by a small "sediment cock" when desired. Then there will be no chance for a reverse current of hot water from the water-back, which would interfere with the general circulation. If the return-pipe has not sufficient grade the flow will be sluggish, and the water will be exposed too long to the fire and will boil or simmer, while bubbles of steam will form and flow with the current into the boiler and there condense on contact with the volume of cold water. This gives rise to an alarming noise called "water hammer," which sometimes breaks couplings or pipes, and makes people think the boiler is about to explode.

Ventilation.—Fresh air is not a luxury but a necessity; it is a lung food and should be pure and abundant. The atmosphere of a living-room should be changed every twenty minutes in order to preserve health. Every house should supply 800 cubic feet of air for each occupant; model prisons require 1,000 cubic feet. People who spend the winters cooped up in small houses hugging the red-hot stove, or who sleep in close, unventilated rooms for fear of the cold night-air, are usually sallow and sickly. The "Great White Plague" kills millions every year owing to popular ignorance and

neglect of ventilation. The test of a well-ventilated dwelling is to enter at any hour and find the air as pure and fresh as that outdoors, with no odors of cooking or washing, or of dust-laden carpets and curtains. To this end rugs and bare floors, open fires, and isolated kitchens and laundries are to be recommended.

A hood should be provided over the kitchen range to carry off cooking-odors and steam from the laundry, and there should be a skylight on the roof to remove foul and heated air which rises to the upper floors. Ventilating the bowl of a water-closet is of no benefit unless the vent-pipe connects with a gas-jet or heated flue. Even an open fire-place does not always

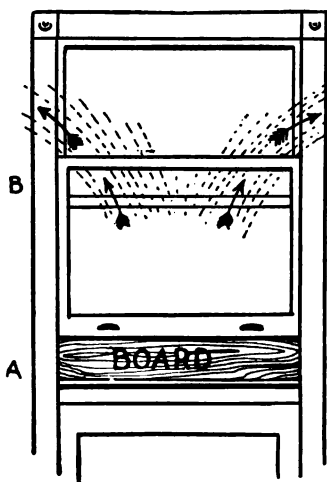


FIG. 365. Window ventilation. By placing a four-inch board across the window at A and raising the lower sash at B, the air will be deflected upward without causing a draft.

“draw,” and frequently there is a down-draft, especially in the vicinity of a stairway. By placing a four-inch board across the lower part of a bedroom-window and raising the sash slightly, air can be admitted between the two sashes without causing a draft (see Fig. 365).

Lighting.—Few persons appreciate how much heat is radiated from an oil-lamp. A Rochester burner will warm quite a good-sized room in winter if placed on the floor; while if a similar lamp is hung directly under a register leading into a room above, it will create a movement of air that will sensibly affect the atmosphere. An ordinary lamp contaminates the atmosphere as much as several persons will do; and where there are a number of lamps in a room the need of ventilation is quickly apparent. This is a strong

argument for the substitution of electric lights or acetylene for oil.

General Hints.—In selecting basins, kitchen-sinks, and wash-tubs, do not have them so low as to necessitate stooping. Bath-tubs also are often too high from the floor for persons of ordinary height, and with tiled or hard-wood floors there is danger of slipping if they are at all wet. A bathroom should be sunny, and large enough to swing an Indian club and to contain a linen-closet as well as a wicker receptacle for soiled towels, etc. Faucets are commonly too small, and the flow of water consequently too slow. The difference in cost is slight. So also with marble slabs for basins, which are easily cracked if made too thin. It is in such details that plumbing work is “scamped.”

Oil-lamps should not be kept lighted in sleeping-rooms, as they contaminate the atmosphere as much as several adults. Nor should young children occupy the same bed-room as older persons, as they need all the air they can get. An ordinary bedroom (10x12x8) hardly contains 1,000

cubic feet of air-space, and this is only partly changed during the night. Therefore, do not rob the child of its just needs. If it slept outdoors under the sky it would not have too much air. Yet, in some families a child, an adult, and a lighted oil-lamp may be found in the same bedroom in the month of August, with the window closed.

If waste-pipes in cellars and kitchens are patched with scraps of lead or tin fastened with wire or twine, it indicates that the kitchen waste-pipe was choked with grease, and that a bungling plumber tried to clean it out. Such openings should be closed securely, and a permanent clean-out inserted, with a brass trap screw for convenience of access.

The fresh-air supply for the furnace should never be taken from a cellar, no matter how clean it may seem; nor should it be taken from an entrance hallway, as is often done in churches to save fuel. Only outdoor air will serve for such purposes.

SANTONIN.—A neutral substance derived from *santonica*, the flower of an Asiatic plant called the *Artemisia pauciflora*. It occurs in colorless, pearly tablets, and is readily soluble in alkaline solutions. An overdose causes everything to appear yellow to the patient. The urine at first is quite yellow, and later may become purplish-red. There may be muscular tremors, or convulsions and unconsciousness. The stomach should be emptied as soon as possible. The principal use of santonin is for the destruction of the roundworm. In this condition, one or two grains of the drug are usually given with calomel to the fasting patient, and this is followed in a few hours by a purgative.

SARSAPARILLA.—The root of several varieties of *Smilax*, shrubby climbers growing in Central America. It is commonly used as a basis for medicinal mixtures; and it seems to enhance the action of certain drugs, as the iodid of potash in syphilis, although it has no definite curative effect of its own. The compound sirup of sarsaparilla contains sassafras, licorice, peppermint, anise, and senna, in addition to sarsaparilla. The dose of this sirup is one to four teaspoonfuls. The sarsaparilla of the soda-water fountain should not be confused with the sarsaparilla of medicine.

SAVIN.—The dried tops of the *Juniperus Sabina*, a small South-European tree of the pine family. The active principle is a volatile oil resembling turpentine. It is a violent irritant. Savin is seldom used in medicine, but is of interest chiefly on account of the fact that it is sometimes taken with the idea of producing an abortion. It is a very dangerous drug, and is apt to cause severe abdominal pain, vomiting and bloody purging, suppression of urine, convulsions, and death. Castor-oil should be given freely after the stomach has been emptied.

SCABIES (THE ITCH).—A skin-disease caused by the itch-mite, a small insect which may enter the skin and cause extensive irritation and scratching. The mite principally burrows into the skin at the wrist, the folds

between the fingers, the inner surface of the elbow, the armpit, the navel, the buttocks, the inner border of the foot, and in all parts which are compressed by tight garments (such as corsets, suspenders, waistbands, etc.). It also attacks the external genitals in men, and the region of the nipple in women. On close observation the infected area discloses whitish lines, several millimeters long. These are the burrows of the mites (see Fig. 366), and each one ends in a yellowish-white pimple. From this elevation in the skin it may be possible, with the point of a penknife, to remove the itch-mite, a moving speck which can be crushed between two finger-nails. As a result

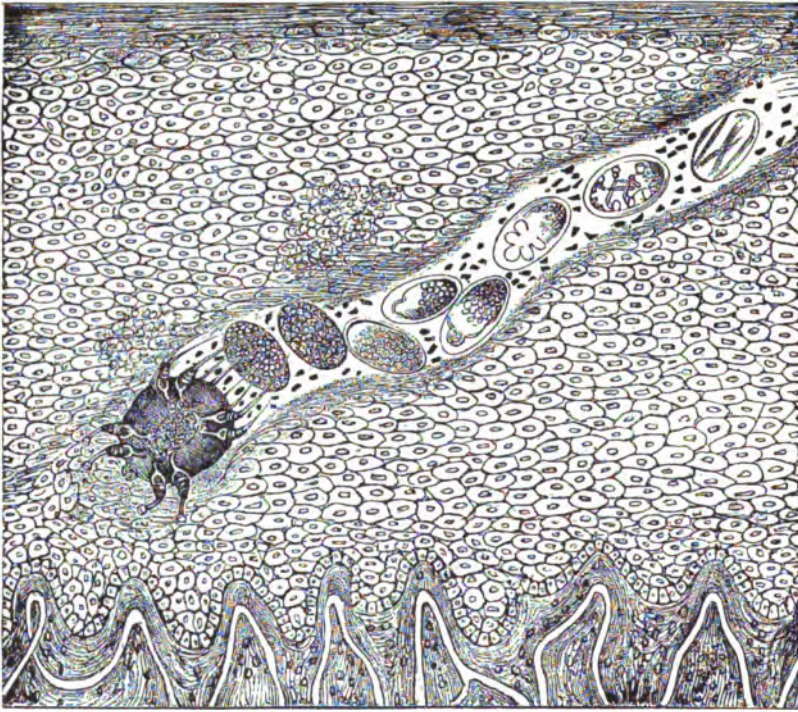


FIG. 366. The itch-mite and its burrows.

of the burrowing and the consequent itching and scratching, also other parts of the body may show red or scratched pimples and blisters, covered with crusts.

Scabies does not heal spontaneously; it should be treated by a physician. Kerosene, which is useful in exterminating other kinds of parasites, is not effective in this case, but may eventually be harmful. It is not necessary to disinfect beds, mattresses, and linen, as the mite can not live in them. But all persons who live in close proximity to the affected individual, or who have been sleeping in the same bed, must be carefully examined.

The itch was formerly believed to be due to a bad condition of the blood, and it was thought that the disease might be "driven inward." These and similar opinions, which are still found disseminated among certain classes of people, and mentioned in quack literature, are erroneous. The eruption is caused by the irritation produced by the mites, and by the consequent scratching; and a disease which is due to the presence of a parasitic organism in the skin can not be "driven in." The itching and the eruption disappear as soon as the mites are destroyed by external remedies. Special treatment is required only in exceptional cases.

SCAMMONY.—A resin obtained from the living root of the *Convolvulus scammonia*, a vine growing in Syria. Its active principle is a resin known as *scammonin*. Scammony is a dark greenish substance smelling like old cheese. It causes a watery movement of the bowels, accompanied by considerable griping. An overdose irritates the stomach and intestines. It is given in doses of three or four grains, usually in combination with other drugs.

SCARLATINA (SCARLET FEVER).—An acute, infectious, febrile disease, characterized by a diffused scarlet rash on the skin, followed by scaling off of the cuticle. It is a very contagious and dangerous disease, usually occurring in epidemics, and often being communicated from child to child in schools and kindergartens. Direct contact with a scarlatina patient is not necessary for the transmission of the disease, for contagion may be acquired by simply staying in the sick-room. Even healthy persons who have been in contact with the patient may, without acquiring the disease themselves, convey contagion to others. Children under ten years of age are most susceptible; but older children, and even adults, often acquire the disease. Recovery from scarlatina usually protects from a second infection, although cases are known of persons who have been attacked repeatedly.

The onset of the disease is usually acute, beginning with vomiting, lassitude, headache, and nosebleed; rarely with a violent chill, or general spasms. The temperature of the body soon rises to a considerable height (104° to 106° F.), the fever being accompanied with the development of the scarlet rash. This rash first appears about the throat and chest, is usually uniformly distributed, and consists of many small, red dots. After two days the entire body, except the chin and the upper lip, may be covered with the rash. Pain in the throat, and difficulty of swallowing also appear at the onset of the affection. These symptoms are due to swelling and redness of the palate, tonsils, and uvula, which in some patients may show a dirty gray, smeary layer (*scarlatinal diphtheria*). The infection causes the glands in the throat and lower jaw to swell, often to the size of walnuts.

In cases which run a favorable course, the symptoms begin to disappear at the end of the first week. The fever subsides, and the rash fades. The swollen glands, however, require a longer time to diminish in size. In the

second week the scaling-off process peculiar to scarlet fever commences, the cuticle being thrown off in large flake-like patches. Not until after the termination of this desquamation may the patient be considered to be well, and all danger of infection passed. In some instances this process may last up to six weeks; and during this period the hands and feet must be examined with especial care, because it is often difficult to determine whether the rash has actually disappeared from these parts.

Scarlet fever does not always run as simple and favorable a course as that described in the foregoing. In many patients the eruption may be limited to certain parts of the body; in others, small white vesicles may develop on a red ground (simple scarlatina); and in still others, bluish-red spots (suggilations) may appear. The appearance of these suggilations usually indicates a severe infection. There are also cases of scarlatina which run an exceedingly rapid and mild course, the disease appearing without any eruption, and being suggestive of scarlet fever only because of the affection of the throat.

Complications are common in scarlet fever. If a second increase in temperature occur after the fever of acute onset had abated, and the patient apparently was recovering, it is probable that one of the many dreaded complicating affections is starting. The most important of these complications are: purulent inflammation of the middle ear; acute inflammation of the kidneys; acute bronchopneumonia; and symptoms of brain involvement. In very young patients the onset of an inflammation of the ear may be suspected when the little patient is very restless, and frequently raises his hands to the ears. Older patients complain of pain in the ear, and of buzzing and singing noises. If the face or the limbs commence to swell, showing doughy pittings on pressure, and if the urine becomes red and thick, an inflammation of the kidneys is developing. An increase in hoarseness, and a dry, painful cough, are indicative of involvement of the bronchi.

To prevent infection one should beware of coming in contact with persons who live in infected houses, and also of obtaining food (especially milk) from such houses. If it be apparent that a member of a family is suffering from scarlatina, he should at once be isolated from the rest of the family. The patient should be placed in a clean bed, in a room which it is not necessary for other members of the family to pass through. The diet should consist of milk and water only. A physician should be called at once. The sick-room should be well ventilated, and the patient washed as often as possible; full baths must be given if needed. This will remove the nauseating odor of herring-brine peculiar to many scarlatina patients. The members of the family should as much as possible be prevented from coming in contact with other persons; and if there be children in the family who are attending school, these should be kept at home, or live for a time with some relative. The wisest thing to do is to send the patient to a special hospital

at the earliest opportunity. Persons nursing scarlet-fever patients should wear washable dresses which can be readily disinfected.

After the termination of the disease—the time being determined by the physician—the sick-room, as well as the body- and bed-linen of the patient, must be thoroughly disinfected by experienced persons. The poison of scarlatina is extraordinarily resistant to germicides, and may give rise to the disease even after many months. Soiled linen should be sterilized by placing it in a 5 per cent. solution of creosol-soap, and should be boiled before washing. See also the article on DISINFECTION.

If parents could be brought to learn that six weeks' loss of time at school is absolutely nothing when compared with the loss of hearing, the loss of eyesight, the chronic crippled joints, the chronic heart-disease, and the weak and diseased kidneys, all of which are very common as results of scarlet fever, they could stamp out this disease, with all its suffering, by keeping the patients isolated and in bed until they are absolutely well.

SCHOOL.—The body and mind of the child during the period of development are much more susceptible to external influences than are the body and mind of the adult; and anything that has impressed a man during his youth is better remembered and more vividly retained than events which occur later in life. It is, therefore, of great importance that the education imparted in school should be as thorough and complete as possible. School education, however perfect, until recently considered merely the development of the mind; and it has only lately been comprehended that quite as careful attention should be bestowed upon the development of the body, and that both mental and physical education should blend into a harmonious whole. Many children remain in school until they are eighteen years of age, or more. They stay in school for several hours almost every day; and it is obvious that many, even seemingly insignificant and slightly harmful, influences may, with this opportunity of continued action, ultimately lead to serious injury.

Many dangers threaten the child while in school. In the first place, owing to the long stay in overcrowded and insufficiently ventilated rooms, the processes of respiration may suffer, and with them the condition of the blood, and the entire nutrition. Hence the pale appearance of many children, the looseness of the skin and muscles, and the loss of appetite. However, it is not alone the air of the room that causes these effects. Such disturbances of health are often induced also by the fact that many children sit in a faulty attitude which more or less restricts the thorough expansion of the lungs. This is associated, consequently, with defective supply of oxygen to the blood, and with disturbances of the circulation of the blood in general. School headache of children, and nosebleed, which is as frequent, are ascribed to these disturbances. A permanently faulty attitude often leads also to abnormal curvatures of the spine (see VERTEBRAL COLUMN,

CURVATURES OF), mostly lateral bendings. Of the organs of sense, the eyes are especially endangered. See EYE, CARE OF.

It is unquestionably true that the school plays a part in the transmission of infectious diseases, for it is obvious that the crowding of many children into a comparatively small room must be conducive to the spread of diseases. Those principally to be considered are measles, scarlatina, diphtheria, whooping-cough, and certain diseases of the eyes. A child attending school may, without being personally infected, bring home a disease to the other children of his family who are not yet going to school.

Disturbances of mental health may be directly due to school conditions. An excess of mental work, and too great a variety of subjects taught, are undoubtedly capable of shaking the nervous system of children who are not very resistant; and morbid changes of the mind, or lack of proper sleep, may occur in consequence. To judge of the extent of harm possibly done by the school is, however, the physician's part. As a matter of fact, the overwork of school children, which at present has become a byword, is often non-existent; and the inability of a pupil to attend to his lessons is frequently due, not to the rules of the school, but to a diseased condition of the pupil. A timely discovery of these morbid symptoms by a thorough medical examination is of equal importance to the parents and to the children. Especial attention must be called to those affections of the upper air-passages (proliferations of the pharyngeal tonsil) which prevent the child from breathing with the mouth closed. This disturbance of breathing affects not only the bodily well-being of the children, but also their mental capacity; and it always requires thorough medical treatment.

Public hygiene endeavors as much as possible to obviate and to prevent all harmful influences of the school. Rational placing of school-buildings, correct distribution of the space allotted to the different rooms, sufficient ventilation, and suitable heating and illuminating arrangements will tend either to remove or to diminish the above-mentioned deleterious influences.

The dust contained in the classrooms requires special attention. As far as possible it should be removed by sufficient damp cleaning. This is greatly aided by dust-binding stains for the floors (dustless oil, etc.), and by a certain construction of the benches (Rettig's school-bench) which permits of a thorough mopping under them. Further, by interposing recesses between the lessons, the pupils are given an opportunity to be in the open air, while at the same time the classrooms are being ventilated.

The correct selection of the school-benches, according to the height of the pupils, is of great importance. From a hygienic standpoint it must be demanded that the places of the pupils are determined by their heights, not by their ability. The benches must be so constructed that a faulty attitude is made difficult for the pupil. The introduction of a vertical, instead of a slanting, handwriting is recommended for the same reason.

To prevent the transmission of infectious diseases, various governments have decreed that children suffering from measles, rubella, scarlatina, diphtheria, smallpox, cholera, dysentery, typhus fever, and relapsing fever, or those in whose families or households any of these diseases are present, must not be allowed to attend school; the same applies to children affected with typhoid fever, Egyptian ophthalmia, scabies, and whooping-cough.

To counteract one-sided muscular exertion, the practise of gymnastics, and still more of athletic and youthful games should be encouraged. Douche-baths established in the schools are worthy of recommendation as tending not only to promote cleanliness but also to harden the body. It is to be hoped, further, that the engagement of school physicians may be more generally adopted.

SCIATICA.—An acute inflammation occurring in the sciatic nerve (see p. 67) or in some of its branches. Frequently beginning in the small of the back, like lumbago, the pain of sciatica follows the course of the posterior nerve of the thigh. Cold, overexertion, injury, and the pressure of feces or of tumors in the rectum, are among the most frequent causes of this affection. The disease often runs a protracted course; but it usually terminates in recovery, although remissions may be frequent, particularly if the patient abuses his privileges.

A patient suffering a recent attack of sciatica should go to bed and place a bolster under the knee of the affected leg, so that he rests with the leg slightly curved. This causes a lessening of the pain. Purges, hot baths, and sweat-cures constitute the further treatment. It is unwise to endure the pain and hobble about until forced to go to bed. By going to bed at once, recovery—both temporary and permanent—is rendered more probable. Long-continued and obstinate cases require recourse to a wealth of therapeutic measures which only a physician can apply to each individual case. Water-cures, medicines, cupping, blisters, massage, gymnastics, baths, and manipulation (stretching) of the nerve, are among the procedures which may bring about recovery.

Success will not fail if the affected person is persistent and patient, and does not allow himself to be led astray by charlatans who promise much but accomplish little. Sciatica is an affection which tries the souls of men, both patients and doctors. One of the greatest curses following in its train is the development of the morphin habit. One should avoid this drug until the last ditch of human ability to stand suffering has been reached.

SCOPARIUS.—The dried tops of the common broom or *Cytisus scoparius*. The active principles are an alkaloid called *spariein*, and a neutral substance, *scoparin*. It depresses the nervous system, particularly the endings of the motor nerves, stimulates the circulatory system, and increases the amount of urine secreted. All of these actions are utilized to some extent in medicine. Scoparius is used to quiet tremors, and will often cure obstinate hiccup.

It is used also as a stimulant to the heart and kidneys. The infusion of scoparius is given in doses of one to two tablespoonfuls.

SCOPOLAMIN.—An alkaloid obtained from the root of the *Scopolia atropoides*, a plant of southern Europe. Its action is much like that of atropin and of hyoscyamin. Scopolamin acts chiefly on the brain (causing sleep, and often a low delirium) and on the spinal cord, which it depresses, particularly the sexual center. It causes a dryness of the throat, like that following the use of atropin. Hyoscin hydrobromid is the preparation most commonly used, and is given in doses of $\frac{1}{100}$ of a grain. It is used chiefly to produce sleep in certain forms of insanity. An overdose calls for emptying of the stomach and administration of tannic acid.

SCOTOMA.—A defect in the field of vision. It is not a disease of itself, but merely a symptom, and is characterized by sudden flashes of light, which are perceptible whether the eye be closed or open. The sensation is referred to the brain, but the patient not only seems to perceive it there, but also complains of flickering inside and outside the eye. In certain instances the defect may be transferred from one eye to the other. The symptom is either transitory or chronic, sometimes lasting for months or years. The disturbance may extend only over the immediate vicinity of the object under observation, or it may involve a larger area. Scotoma is either the expression of a disease of the eyeball, of the optic nerve, or of the brain; or it may exist without any organ being involved. As an example of the latter condition, reference may be made to the flickering noticed in front of the eyes before a fainting spell. A scotoma involving both eyes, and extending over almost the entire visual field, renders the patient practically blind for the time being. This condition is called "flittering scotoma," and may be followed by headache and vomiting. Notwithstanding its disagreeable features, the affection is nevertheless free from danger. It is generally the result of mental overexertion, general nervous weakness, or anemia. Very often it appears as an accompanying symptom of migraine.

SCROFULA.—A morbid, often hereditary, constitutional condition, characterized by prolonged and recurrent inflammatory affections of the skin, mucous membranes, eyes, ears, nose, lymphatic glands, bones, and joints. It is a disease of childhood and youth, often beginning during the first year of life and recurring repeatedly until the middle of the twenties. A predisposition for this disease is in most cases inherited, and a great many patients are children of tuberculous parents. In only a very small number of cases is the tendency acquired after birth. The disease is never traceable to vaccination, as is claimed by some who make it their business to attack existing institutions. The appearance of affected children is often indicative of the disease. Some children are pale and look wizened; and they are irritable, although mentally bright. Others have fat, distended bodies, thick upper lips, red-edged and swollen eyelids, and are usually of inferior

mentality. Scrofulous children usually suffer from fatigue, headache, and sleeplessness, and at times from slight fever.

The most frequent symptom of scrofula consists in swellings of the lymphatic glands. Hard, round, painless lumps, gradually attaining the size of walnuts, appear on the neck, nape, lower jaw, and in the armpits and groins. Sometimes these lumps diminish in size, and may even disappear entirely; but in most cases they continue to grow, gradually softening, and finally breaking through the skin which has become thinner and thinner. When this happens, the swellings discharge either pus or a cheesy fluid containing small particles. Unless treated medically, the fissure will remain open for months or years, with a continuous discharge of thin fluid. Such cases, when cured, always leave disfiguring, retracted scars. Among other symptoms of scrofula may be mentioned: scaly eruption on the scalp, ears and face; dry coryza resulting in a scabby nose and upper lip; catarrh of the conjunctivæ of the eyes, and swellings of the corneæ, usually accompanied by great sensitiveness to light, and often resulting in severe disturbances of sight. Inflammation of the internal ear, characterized by a discharge which is often neglected, is another very frequent symptom of scrofula. It often occurs in the first year; and in some cases it greatly impairs, or even totally destroys, the sense of hearing. The inflammation may involve the brain, thus causing death. Enlargement of the pharyngeal and palatal tonsils is an additional symptom of scrofula, and is frequently indicated by a nasal voice, by impaired hearing, and by sleeping with the mouth open. Scrofula of the bones and joints is usually a severe type, and is characterized by slowly developing swellings with purulent discharges.

The course of scrofula is always lengthy, but with proper treatment a cure may frequently be effected. Very often, however, the symptoms are not recognized promptly; or valuable time is lost in trying salves or other remedies recommended by some old woman or all-knowing neighbor. Besides, a scrofulous person is rendered extremely susceptible to tuberculosis, and frequently contracts this disease.

For the prevention of scrofula, and of the tuberculosis which so readily follows it, it is necessary, if possible, to separate children and parents when the latter are tuberculous. New-born children must never be nursed by tuberculous mothers; and other children must not use the same cups and dishes that are used by tuberculous members of the household. The conditions of living are of the greatest importance in the prevention and cure of scrofula. Children who are predisposed to the disease, or who have already acquired it, should be brought up in clean, well ventilated, dry, and sunny dwellings; for bright daylight and pure air are essential in the treatment of scrofula. The greatest degree of cleanliness by washing and bathing is likewise of paramount importance; and the child's body should be carefully hardened by a gradual decrease in the temperature of the water used (see

HARDENING). Milk, or dishes made with milk, should have first place in the diet. Kephir and kumiss (fermented milk beverages) are also of value. All kinds of meat (preferably roasted), as well as soft-boiled eggs may be eaten, together with fresh vegetables, such as spinach, cabbage, cauliflower, carrots, and peas. Beer and wine are injurious to a child, and should be strictly omitted. In cold seasons the child may be given one to three tablespoonfuls of cod-liver oil daily.

In a case of pronounced scrofula, a physician should be consulted, and no attention should be paid to non-professional advisers. The old woman who claims that the removal of the rash from the child's head will cause it to break out on some other part of the body, or on some other member of the family, should not be heeded. Neither should one grease the swollen glands with oils, fats, or ointments. The physician's advice should be conscientiously followed, even when he deems it necessary to have the focus of the disease removed by an operation. Careless treatment may result in the child losing the sense of sight or of hearing, in deformities of the limbs, or in fatal tuberculosis of the lungs. Immediate medical aid is necessary for every injury, however slight, to a scrofulous child, abscesses or affections of the eyes particularly. A sojourn in the country or at the seashore is of great benefit to a child suffering from scrofula.

SCURVY (SCORBUTUS).—A disease traceable to a disturbance in the metabolism of the body, although up to the present time the exact causes are not known. It is known, however, that the ailment is promoted through unfavorable conditions of life, wherefore the poorer classes are most exposed to it. What with ever-increasing improvement in sanitary regulations, and an ever-spreading enlightenment regarding hygienic ways of living, scurvy has become a rare disease even in the lower strata of society. At present it occurs chiefly in northern regions where the severe cold keeps the natives shut up in their huts for prolonged intervals, prevents them from taking sufficient exercise, and limits them in the variety of articles of nourishment. For the same reasons the disease is often a dread companion on long sea-trips.

The affection begins with fatigue and with inflammation and bleeding of the gums, accompanied by falling out of the teeth, and a foul odor from the mouth. Then follow hemorrhages into the skin and muscles, more rarely into the mucous membranes and body-cavities; and disturbances of the organs of digestion appear. The disease runs a protracted course, lasting for weeks or months, but usually terminates favorably. Fruits (especially lemons), vegetables, fresh meat, milk, and butter, together with fresh air, are helpful in the prevention of the disease, and are of primary importance in the treatment. The affection of the mouth, as also the other symptoms of the disease, demand strict observance of the physician's directions, in order that prolonged illness may be avoided.

SEA-BATH.—The effect of a sea-bath is more pronounced than that of a bath in a lake or river, because the motion of the water is more violent, the water contains salt which acts as a stimulant to the skin, and the sea-air is more invigorating than the air of the interior. The characteristics of a sea-bath are the billows, and the salt contained in the water and in the air. This withdraws a considerable amount of heat from the body of the bather, and this heat must be again supplied by heightened metabolism, resulting in an increased appetite. Thus the entire body is strengthened, provided that sleep is normal. Many persons, particularly neurasthenics, do not do well at the seashore. Their sleep is disturbed, and they suffer from palpitation of the heart, and have sensations of fear. Such persons, as well as those who suffer from heart-disease or from pulmonary consumption, ought not to go to the seashore.

Sea-baths are especially beneficial for scrofulous children, and for patients suffering from stubborn catarrhs of the respiratory passages. The choice between different seaside resorts must depend upon the strength of surf desired. Some patients are not allowed to take surf-baths, but are given tub-baths with warm sea-water instead. Weak and anemic persons stand these baths very well. For a sick person, a good general rule for the duration of a surf-bath is: "Take three dips and come out." The bath should be followed by a thorough drying of the skin, and by exercise. Young children often derive great benefit from a summer at the sea; but if kept too long they may become overstimulated, and a stay in mountain-air, where they may indulge in lake or river bathing, is then advisable.

SEASICKNESS.—Name given to a number of distressing symptoms experienced on board ship, and caused by the peculiar movements of the vessel. There are different degrees of seasickness. The simplest form is characterized by lack of appetite, a loathing for all food, and a sensitiveness to the odors of dining-room and kitchen. As a rule, however, the symptoms are more severe. The majority of seasick persons are affected with an inclination to yawn frequently, and much nausea and vomiting follow. The typical seasick person lies in his bed perfectly apathetic, vomits everything he eats, and finally vomits also bile and mucus.

Countless external and internal remedies have been extolled as efficacious cures for seasickness. Not a single one, however, has fulfilled the promise held out. A strong will and an absence of fear are the two things best calculated to make seasickness subside. It is commonly supposed that a sound stomach is a preliminary requirement. Such, however, is not the case. Very often persons suffering from severe stomach trouble are good sailors; while others, who have strong and healthy stomachs, get ill even when the weather is fair and the sea practically smooth. Many persons lie down in their cabins as soon as they get on board a ship. This affords relief, but does not prevent seasickness. It is more expedient to remain on deck,

in the fresh air, as much as possible, and also to take meals on deck. Since it is advisable to avoid indigestible foods when ashore, it follows that these must be absolutely abstained from when on the water. Only a limited quantity of food should be taken, and one should not let the customary big dinners given on board the large transatlantic liners beguile one into eating too much. It is well to partake of a light meal about every four hours. Liquids, particularly alcoholic drinks, should be taken in moderation, especially when one is not accustomed to them. Attention must be paid to regulating the movements of the bowels by eating plenty of cooked fruit, and by drinking bitter mineral waters, etc. If the seasickness becomes very severe, the ship's doctor can relieve at least the most trying symptoms with appropriate remedies. The massage method described under VOMITING often gives good results.

Among the motions of the ship, the rolling (that is, the motion upon the short axis) is the most disagreeable for the seasick person, and becomes more annoying when one moves away from the center of the ship, in either direction. This annoyance is further aggravated when the screw passes out of the water, when, on account of diminished resistance, it revolves more rapidly. This condition affects even a good sailor if he sleeps above or near the screw. It is, therefore, best to choose a cabin amidships. The pitching motion (on the long axis) is less apt to produce seasickness. The best position in which to sleep is one in which the body is kept parallel with the axis on which the vessel moves, so that the body rolls from side to side rather than up and down. Although every seasick person imagines that he is going to die, there are no records of death from seasickness. The majority of patients recover in a few days, or even sooner if they are very energetic.

SEA-TRIPS.—For some persons such trips not only aid recuperation, but if carried out properly may effect a cure of a number of complaints. Some conditions, however, may be aggravated on account of the hurry and excitement connected with the preparations for a trip. In long voyages these disadvantages do not count; and extended trips are, therefore, advisable for patients (chiefly neurasthenics) who wish to be absolutely cut off from the world for a long time. On board a sailing-vessel, taking a trip of several months, a patient is free from the worries of business and from the noise and bustle of the streets. He is spared all excitement. The absolute quiet on board ship, the invigorating and dust-free sea-air, the uniform mode of living—all these are of benefit to him. On such an extended voyage the inclination to SEASICKNESS (which see) is soon overcome. Moreover, the movements of a sailing-vessel are said to be less conducive to this condition than those of a steamer.

SEIDLITZ POWDER.—A compound, effervescent, saline powder, put up in two parts. One part is composed of 120 grains of Rochelle salts and 140 grains of bicarbonate of soda, and is wrapped in blue paper. Its com-

panion, in white paper, consists of 35 grains of tartaric acid. Each powder is dissolved separately in half a glass of water, and the two solutions are then mixed. The reaction causes an active effervescence, and the draft is taken while it is bubbling. The result is like the action of Rochelle salt, being dependent upon the presence of that drug; and a watery movement of the bowels follows in a comparatively short time. It is the most pleasant and least nauseating manner in which to take a saline laxative.

SEMINAL LOSSES (SPERMATORRHEA).—Involuntary discharges of semen, unaccompanied by sexual excitement. Such emissions should by no means be looked upon as signs of disease. On the contrary, involuntary discharges of seminal fluid, occurring at intervals of one or two weeks, must be considered a normal process in healthy young men. During the first years of beginning puberty the night dreams recur at intervals of three to six weeks; but with the completion of sexual development their frequency increases, and it must not be considered a morbid symptom if the discharges of seminal fluid finally occur every two weeks or even every week. Personal predisposition, mode of living, occupation, and state of nutrition are important factors in this respect.

There is not the slightest reason to advise young men, who occasionally may become worried about the nightly emissions, to have sexual intercourse. Such discharges will not cause a young man to feel weak or morbidly irritated; but, on the contrary, he will feel refreshed, brisk, and strong. One should look upon this discharge of semen as a very natural outflow of an excessive and unused secretion of the testicles, a process which will in no manner be followed by disturbances. It appears especially necessary to emphasize the fact that the seminal fluid does not contain any "nerve-substance," the loss of which would be of special significance to the spinal cord and be apt to cause locomotor ataxia. This is a wide-spread, but absolutely erroneous belief.

Under certain conditions, however, seminal emissions may take place several nights in succession, or even several times during one night. This is especially the case in young men who early began to have sexual intercourse, or who practise it to excess. Excessive masturbation, nervousness, and abnormal irritability are likewise factors in causing frequent seminal discharges. The effect of such a condition is to cause a disagreeable relaxation; and the elasticity of the mind suffers. In such cases morbid processes are at work, the judging of which is a matter for professional advice, as this abnormal condition is often the result of local affections which require medical treatment. Such patients can not be too emphatically cautioned against reading so-called popular writings, as well as the pamphlets distributed by certain practitioners. Unfortunately, there are unscrupulous physicians who make it their business to take the most impudent advantage of unfortunate persons who, with or without any fault

of their own, suffer from this disorder. Such physicians depict the great dangers of the condition (impotence; loss of manhood; etc.) in the most fantastic manner, and ruin their victims morally. One should be most emphatically cautioned against entering into correspondence with persons of this class. The vastly exaggerated descriptions of the dangers of the existing morbid condition have caused many promising young men to commit suicide in despair.

A practical cure in all these cases can result only from conscientious psychic—medicinal or non-medicinal—treatment by a physician. The selection of the proper method of treatment can be made only after a careful study of the prevailing affection; and any form of self-instruction from popular or medical publications is dangerous. Such subjects of reading will but too frequently cause the patients to conceive hypochondriac hallucinations, and to fall victims to sexual neurasthenia, a wide-spread condition. On the other hand, there can be no doubt that treatment by an experienced physician will in most cases effect recovery, without impairing the sexual functions of the affected individual. Much as physicians are convinced of the deleterious effect of excessive masturbation upon the physical and mental health of the young, it rarely happens that permanent and incurable harm results therefrom. Such severe disturbances are due either to an inherited or acquired predisposition, or to accompanying circumstances.

An essentially more dangerous degree of morbid losses of semen are the so-called day pollutions, in which—while the individual is fully awake—semen is discharged under the influence of slight mechanical irritations or of sexual excitement. These emissions may occur without erection of the organ, either by jerks or without distinct ejaculations. Still more dangerous are those cases in which permanent losses of semen occur under the influences of a paralysis, and an almost constant discharge of seminal fluid takes place in the form of drops. It is obvious that a proper opinion as to prognosis and treatment can be rendered only by a physician. The two last-named forms of spermatorrhea are fortunately rare; and those cases in which the patients worry without sufficient reason are by far the more frequent.

It is not infrequently noted that losses of semen occur in persons who for longer or shorter periods have been given to sexual excesses; and also in those who were, or are, affected with obstinate inflammations of the posterior urethra, of the prostate gland, or of the seminal vesicles, without any other disturbances whatever being present. These individuals, during urination or when evacuating the bowels, often discharge larger or smaller amounts of a shiny, thread-like fluid which smells of semen. On microscopical examination this discharge is found to be a secretion of the prostate gland, and may sometimes be mixed with seminal fluid. This form of

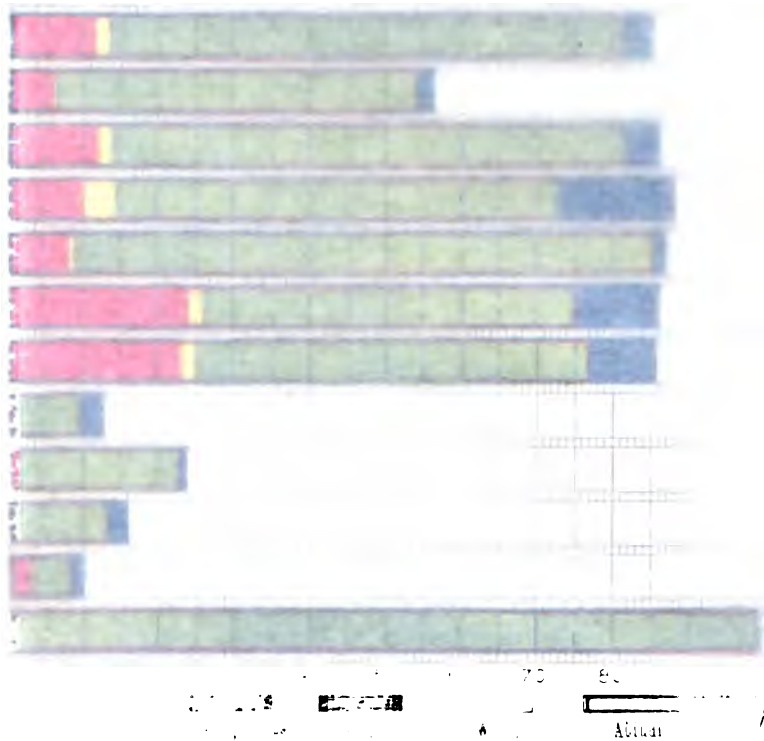
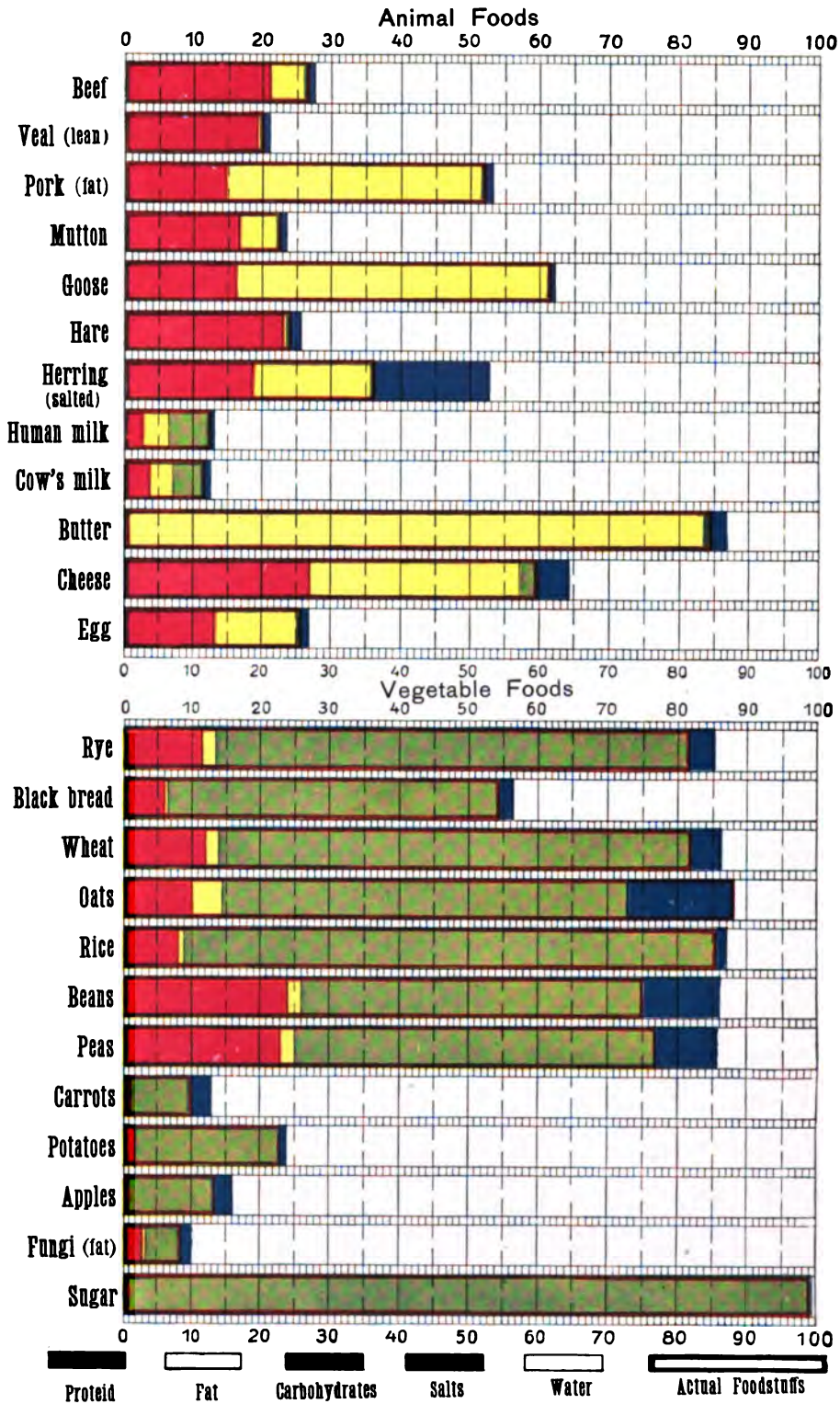


PLATE XIX.—COMPARISON OF DIFFERENT FOODS

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COMPARISON OF DIFFERENT FOODS



seminal losses, although often difficult to cure, is usually without danger, in so far as impotence seldom results therefrom. The disorder can be greatly improved, in fact often completely cured, by proper medical treatment.

Finally, an absolutely normal occurrence may be mentioned, which inexperienced or overanxious persons often erroneously regard as a sign of inflammation of the urethra, sometimes also as spermatorrhea, and which becomes a source of great mental unrest. The influence of prolonged sexual excitement causes a secretion of certain glands, the channels of which open into the anterior portion of the urethra. This secretion becomes visible, and can be felt as an adhesive, viscid fluid at the external opening of the urethra. This is a secretion of the so-called Cowper's glands, and is of no morbid significance whatever. It is a constant symptom of sexual excitement; but quacks make of it a great mystery, and look wise, and shake their heads, telling the patients how severely ill they are.

As all genuine forms of morbid losses of semen must be looked upon, not as an individual disease, but as a symptom of other affections, it is not possible to lay down any general rules for the removal of the same. It is the concern of a scientifically trained physician to investigate the causes of the prevailing disturbances, and to give his advice in accordance with the conditions that present themselves in each individual case.

Among the hygienic measures which should be followed in order to counteract too frequent discharges, the following may be mentioned: The diet should consist of easily digestible dishes, and the supper especially should be very simple and light. Plenty of bodily exercise should be taken during the day. All forms of sport, except horseback-riding and bicycling, are to be recommended. One should sleep in a cold room, on a hard, flat mattress; and the cover should be as light as possible according to the season. It is advisable to sleep lying on the side; not on the back. The urine should be discharged shortly before retiring; and larger quantities of fluids, especially alcoholic drinks, should not be taken for at least two hours before going to bed. All forms of sexual excitement, as well as hard mental work should be avoided in the evening. A sojourn in the country, plenty of exercise, and cool baths are beneficial. Internal or electric treatment should be resorted to only on the advice of a physician. When the losses of semen pass distinctly beyond the limits of what is normal, or if night-discharges cause a feeling of lassitude and depression on the following morning, a physician should be consulted without fail. Day-discharges, as well as permanent seminal losses, require prompt medical attention.

SENEGA.—The dried root of the Seneca snakeroot, *Polygala Senega*, a small herb growing in the United States. The root is several inches long, contorted and wrinkled, and has a peculiar slight odor, and a sweet, acrid taste. It contains a saponin and senegin. Senega is sometimes used in the late stages of bronchitis, and in dropsy due to kidney-disease. An

overdose will cause vomiting and purging. The sirup of senega is given in teaspoonful doses.

SENILITY.—It is an inflexible law of nature that every organic body, after it has reached the period of its greatest and highest development, begins to undergo a process of gradual disintegration. Man is subject to the same fate; and, like plants and animals, he is created, blooms, and passes away. With advancing old age, all his vital functions decline, as the organs become exhausted, undergo a retrograde change, and finally, one by one, cease to be active. Digestion becomes sluggish, less nourishment is taken and less is used, appetite and thirst are diminished. This results in emaciation and loss of strength. The tissues are deprived of their tone, the skin is relaxed and dry, the sensory organs are dulled, and the blood-vessels readily rupture, which accounts for the tendency of paralytic strokes to occur during this period. The activity of the heart and lungs is lessened, and shortness of breath results. In addition to this the hair turns gray, wrinkles develop, the eyes recede, the teeth drop out, a stooping posture is assumed so that the height is diminished, and the hands and the head tremble. Mental activity and judgment become impaired in old people; some become childish, but the majority forgetful. These phenomena do not all appear at once; in some persons the bodily, in others, the mental, shortcomings are most marked. On the other hand, there are persons who remain vigorous although well advanced in years. This favored condition may be attained when the strength has been carefully husbanded, when every exertion has been followed by the necessary amount of rest, and when moderation in living has been exercised and persisted in.

The symptoms of senility gradually increase until death ensues. Death due to old age may be compared to a peaceful slumber. This is the natural end of life, but unfortunately not the usual one, for in most instances disease cuts the thread of life at an earlier day.

Old people may be more comfortable and better able to resist the encroachments of disease, if they carefully follow the rules of health appropriate to their time of life. The most essential of these rules calls for absolute mental and bodily rest; that is, avoidance of muscular exertion, exhausting brain-work, and excitement in general. The food must be readily digestible, but may be well spiced, and should be easy to chew. Overindulgence in eating and drinking is always harmful, and usually leads to obstinate constipation and cerebral congestion. Although wine has been designated as the "milk of the aged," alcoholic beverages are not to be recommended in advanced years. On account of the diminution in body-heat, old people should always dress warmly, and beware of any sudden loss of heat, as well as of exposure to drafts or dampness. Warm baths only should be taken. Because of the diminished resistance to disease, a physician should be called as soon as any morbid symptoms manifest themselves; but the impossible

should not be expected of him. The affections of old age can not always be driven away by medicinal means, and there is no acknowledged fountain of youth. As much relief as possible should be afforded; but it must not be forgotten that great deeds and extraordinary exertions depend for their execution on youth and strength, and not on old age.

SENNA.—The dried leaves of the *Cassia acutifolia* of Egypt, and the *Cassia angustifolia* of India. The active principle is cathartic acid. Senna is an active laxative, which probably acts by direct irritation of the intestine, and possibly by causing an increase in the flow of bile. When given to nursing mothers, it will appear in the milk and cause purging in the child. The urine may appear yellow or red after taking senna, but this is entirely without significance. The drug may cause considerable griping pain, and is therefore often accompanied with aromatics. Senna is the principal agent in the compound licorice powder. Another common preparation is the confection of senna, which is given in teaspoonful doses.

SEPTEMIA (SEPTIC INFECTION).—See PYEMIA AND SEPTEMIA.

SEWAGE, DISPOSAL OF.—A large part of the waste material derived from the bodies of men and animals, and from their habitations, is liable to undergo decomposition. It must, therefore, be disposed of, as its accumulation above or below the surface of the earth, particularly in thickly populated districts, would soon cause contamination of the soil. This, in turn, would lead to infection of the well-water, and in this way to the dissemination of contagious diseases, such as cholera and typhoid.

Drainage may be limited to the disposal of the human excreta by collecting them in ditches or boxes, and subsequently removing them; or they may be gotten rid of by installing a system of running water in pipes for flushing out the closets. This method is recognized as the best from a hygienic standpoint; and, wherever it has been introduced the sanitary conditions have been remarkably improved. In some cases it is sufficient to drain this sewage into the nearest river, which can usually purify itself of a moderate amount; but as a rule it is wiser to subject the sewage to a cleansing process before permitting it to enter the stream. Sweepings are either carried away and deposited in dumps, or are burned. Garbage is largely converted into fertilizers. See also SANITATION.

SEXUAL DESIRE.—Under normal conditions the sexual impulse appears at the time of puberty. Climate, education, and physical constitution exert a great influence upon its earlier or later appearance. As a natural impulse it is bound to occur in every healthy individual. Among aboriginal peoples the desire for sexual intercourse is generally gratified as soon as it manifests itself. In civilized countries, however, this is usually prevented by various circumstances. This may be said to be fortunate, for the gratification of the violent impulse which manifests itself at this age might readily lead to harmful excesses.

The sexual impulse manifests itself in both sexes by peculiar psychic symptoms. The period of adolescence—with its wild pranks, its faults, and its peculiarities—precedes the onset of the sexual desire. There are two events especially which give rise to a powerful psychic emotion; namely, the first emission of semen in the boy, and the first occurrence of the monthly period in the girl. Great alarm usually prevails in either instance. Unfortunately, it is very difficult to give the proper advice in these matters. Most children, it is true, are fully informed by older playmates, by servants, etc. But even when the occurrence of the first natural discharge is fully expected, the event never fails to be accompanied with powerful emotions. Many young persons become actually sick and morbidly depressed in consequence of wrong instruction. The reading of books written on these subjects by interlopers, exaggerating everything to the utmost, is especially harmful.

In the young man the first discharge of semen occurs with voluptuous sensations, usually at night, subsequent upon a sexually exciting dream. It may frequently be brought about also by female caresses. In most cases it occurs toward morning when the bladder is filled with urine, thus causing irritation. In healthy, young, vigorous men, such discharges of semen recur spontaneously every one or two weeks, sometimes oftener. This is a normal condition. Puberty in the female is characterized principally by the advent of the monthly discharge of blood. See **MENSTRUATION**.

The appearance of the sexual impulse, and the impossibility of at once gratifying the same normally (which is not at all necessary), is very apt to cause many young persons to practise **MASTURBATION** (which see). It is, therefore, the duty of parents and teachers to watch the children most carefully, especially during this period of life, and to guide them correctly. A prudent enlightenment as to sexual matters is quite opportune at this time.

Psychic emotions, and sexually exciting dreams are bound to occur in both sexes. The best protection against them will be found in a certain hardening of the body (see **HARDENING**), in plentiful exercise in the open air, and in good, non-irritating food. One can not caution too much against the so-called "deadening of the flesh" in order "to combat sin," regardless of whether it consists in prayers or in penance and fasting. Any weakening of the body will merely increase the sexual irritability and aggravate the evil.

Perverse sexual impulses are usually due to an inherited morbid predisposition. Sometimes, however, they may develop in consequence of over-excitement and of the weakness caused thereby, with wanting satisfaction during normal sexual intercourse. This perversity manifests itself in various manners. In some cases the individuals develop peculiar inclinations toward the opposite sex; in other cases they manifest an abnormal dislike of the opposite sex, and a simultaneous affection for persons of their

own. Persons afflicted with such perversities should consult a nerve specialist, since it is frequently possible, by proper treatment, to effect a cure.

SHAKING PALSY (PARALYSIS AGITANS).—A chronic disease of the nervous system, which usually attacks only persons of an advanced age, particularly men, and without any demonstrable cause. The persons affected seem to have been very healthy previously, but it appears that mental and psychic overexertions, vexations, and injuries may favor the occurrence of the disease.

The fully developed affection is characterized by a peculiar tremor, and a distinct attitude of the body, combined with a tendency to fall forward (see Fig. 367). The patients are not able to turn about readily, and when walking they continue in a straight direction until they encounter an obstacle. By supporting themselves against this obstacle they place the body in a different direction, and then continue their walk. As the disease progresses it becomes difficult or impossible for them to rise from a chair without assistance, partly because they are not able to use their hands by reason of the shaking, and partly because of stiffness and rigidity of the musculature of the entire body. The trembling of the hands and forearms, sometimes also of the lower jaw and of the feet, is especially noticeable. The shaking of the hands is an early manifestation, and it usually begins with movements of the thumbs toward the index-fingers.

The disease progresses slowly for years, although occasional improvements occur. Medical treatment with natural or artificial warm baths, mild electric baths, moderate massage of the entire body, and internal medicines, may give relief. One should beware of radical, so-called "regeneration cures," as these aggravate the disease.

SHINGLES (HERPES ZOSTER).—A disease of the skin, accompanied with symptoms of nervous disorders. Following an attack of neuralgic-like pains, smaller or larger blisters, varying in size from that of a millet-seed to that of a bean, appear on one side of the body, usually extending half way around the body like a girdle. The area of skin upon which this eruption develops, is red and inflamed. The eruption is distinguished by the grouping of the blisters in clusters resembling a bunch of grapes, the individual parts looking like small sago grains. Shingles frequently appears on the chest or on the abdomen, extending from the spinal column to the



FIG. 367. Characteristic attitude of the body in Shaking Palsy.

anterior middle line. The eruption may appear also on the back of the head, on the neck, on the arm, or on the forehead. In the last-named case it often involves the eye, leading to the formation of scars on the cornea, or even to blindness. The eruption is usually preceded by more or less severe nerve-pains, and these may persist also long after the disappearance of the cutaneous symptoms. There is almost invariably the precedent history of



FIG. 368. Shower-bath apparatus.

exposure to cold, or the symptoms of a malarial infection. After a few days the blisters dry, forming crusts which fall off and frequently leave scars. The duration of the disease is from one to three weeks.

The treatment of shingles consists in dusting the affected parts with rice-powder, or in applying compresses of cold water or of lead-water. Remedies for the wounds and ulcers which occasionally arise from the blisters, and for the nerve-pains which are often difficult to combat, will be prescribed by the physician who should be consulted as early as possible.

It is important to have the gastro-intestinal tract in a healthy condition, as most of the attacks follow severe dietary indiscretions. Herpes is to be interpreted as a nerve-lesion, reflecting a disturbance in some internal organ of the body.

SHOWER-BATH.—A hydrotherapeutic measure of French origin, which has been quite universally adopted. Special apparatus have been provided for regulating the force and the temperature of the douche, and without such appliances the procedure is ill-adapted for the treatment of the sick. A shower-bath should be directly connected with a permanent water supply, the pressure of which may be regulated; and a suitable arrangement for heating both the room and the water must be at hand.

The so-called rain-douche or shower (see Fig. 368) is largely used in public baths, where it may be necessary to guard against a waste of water. It is intended as a substitute for a complete body-bath as a cleansing agent, but fails to answer this purpose. If given cold, this form of douche acts as a strong stimulant to the skin and also cools off the body. The colder the water, the shorter should be the exposure. This shower may only be given when the skin of the body is warm, and if necessary a warm bath should precede the douche. There are several varieties of shower-baths. One of the best is an apparatus which sends out fine streams from every direction. This is a powerful stimulant to respiration, and may be employed where it is desired to increase this function, as in pleurisy, chronic bronchitis, etc.

In the so-called Scottish douche, warm and cold water is used alternately. The apparatus should be so arranged that the change from one to the other can take place gradually, and without interruption. By this change in the temperature, the circulation of blood in the skin is very markedly influenced. Chronic rheumatism, stiff joints, and nerve-pains, are all greatly benefited by this procedure. The "sitz-douche" is so arranged that a stream or spray strikes the patient's seat from below. It is mainly employed in hemorrhoidal conditions, and in pelvic, rectal, and genital diseases.

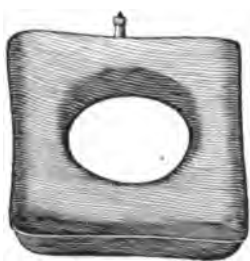
Sprays or ray-douches may be used for various purposes, and may consist of streams of varying force and thickness. A voluminous stream which strikes the body under a great deal of pressure shocks the system considerably, and can be endured only by robust individuals. Women and children should never use such douches. They may be of value in severe nerve-pains, in muscular and articular affections, and for a general hardening of the body. See **HARDENING**.

SIALORRHEA.—A condition marked by increased secretion of the salivary glands. It may result from diseases of the mouth, from mercury-poisoning, from nerve irritations, or from affections of the stomach or intestine. The disease impedes speech, as the patient must keep swallowing

the saliva, or else allow it to trickle from the mouth. Sialorrhea is frequently accompanied by disturbances of sleep, difficulty in swallowing, fulness or distention in the region of the stomach, loss of appetite, vomiting in the morning, and loss of weight. The course of the disease depends upon its cause, and the mode of treatment must be determined by a physician.

SICK, DIET FOR.—See **DIET**; **NOURISHMENT**.

SICK, NURSING OF.—The time has gone by when, even in country communities, a sick person is expected to depend for nursing upon neighbors who “run in and take turns” in tending the invalid, each with a different idea of what should be done, and agreeing only in a sublime disregard for the doctor. The evolution of the trained nurse has proceeded parallel with the developments of modern medicine, and especially with the tendency to rely more and more upon other means than the administration of drugs to combat disease. Almost any one could give a prescribed dose of medicine at a given time, but to do skilfully, swiftly, and effectively all that the modern interpretation of the word “nursing” implies, requires not



FIGS. 369, 370. Air-cushions.

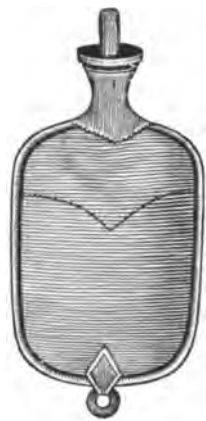


FIG. 371. Water-cushion.

only a large fund of theoretical knowledge, but a long and careful training, and practical experience as well. Fortunately, the prejudice which at first made it seem to some devoted souls a cold-hearted thing to turn the care of their loved ones over to a stranger, has given way before the good results obtained, and they now realize that the kindest thing to do is to secure for the patient the comfort and safeguard of a care which the keenest intelligence and the utmost devotion can not furnish through untrained hands.

Where it is still impossible to obtain the services of a trained nurse, as is sometimes the case, the volunteer nurse must get from the attendant physician directions as detailed as possible, and follow them implicitly.

Cleanliness is a prime requisite in nursing the sick. Every day the necessary utensils should be brought near the bed, and the patient should have hands and face bathed, mouth and nails cleaned, and hair put in order. The hands should be washed after every meal and after every discharge from the bowels—a rule also to be followed in health. In the morning, and

also after each meal, the mouth should be cleansed with a tooth-brush, or at least by rinsing it with fresh water. The development of crusts and scabs or white spots (thrush) on the lips, tongue, palate, etc., can be prevented by wiping the mouth every two or three hours with a bit of cotton wrapped around the index-finger and dipped in fresh water or in a 5 per cent. solution of borax. If the patient can not open his mouth, entrance may be effected behind the last molar tooth, or a wooden wedge may be used.

The linen of the patient must always be clean. It should be changed



FIG. 372. Proper method of lifting a patient without touching the injured leg.

whenever soiled with sweat, blood, vomitus, etc., if necessary several times a day, and in any case at least twice a week. In removing the patient's shirt, his bent arm must not be forcibly pulled through the front opening. Instead, the nurse should place one hand under the patient's neck and shoulders, raise him a little, slide the back part of the shirt upward, and then put him down again. Then the patient's hands should be extended upward, both shirt-sleeves grasped, and the shirt pulled off over the patient's head. When dressing the patient, fresh, warmed linen should be used. In putting on the shirt, the arms should first be inserted into the sleeves, whereupon the back of the shirt should be gathered up and carefully drawn over the patient's head.

Patients who are seriously ill, and who often soil themselves, may frequently suffer from bed-sores. Such sores are painful as well as dangerous, and their development reflects on the nurse. Whenever a blood-red point is noted in the small of the back or in any part where the skin is slightly



FIG. 373. Joining of hands to lift a patient.

pressed between a bone and the mattress (on the shoulder-blades, buttocks, heels, etc.), the nurse should be doubly careful in looking after the cleanliness and softness of the bed, and in seeing to it that the sheet is stretched smoothly. In order to avoid the appearance of these tender spots, the patient should every day be placed upon his side, and his back washed



FIG. 374. Apparatus enabling patients to raise themselves.

with cold water and then dried. As long as the skin is not sore it is permissible also to rub it with a piece of lemon. The sheet must be changed frequently, and stretched smoothly so that it has no folds. A soft cushion covered with chamois-skin may sometimes give comfort. If the patient

be very emaciated, an air-cushion should be placed under the small of the back (see Figs. 369 and 370). The cushion should be placed so that the tender part of the skin rests in the hollow, thus preventing contact with the bed. Very helpless patients should rest on water-cushions (see Fig. 371), and in order to facilitate the placing of a bedpan, it is advisable to use horseshoe-shaped cushions. If bed-sores have already appeared, the physician's directions must be followed.

The lifting of the patient must be done with as little strain as possible for both patient and nurse. The patient must never be grasped from above with bent fingers, but only from below with the hands perfectly flat. An



FIG. 375. Laying down a patient.

injured or tender spot must not be touched. The lifting should be done firmly, yet tenderly. If the patient is to be lifted entirely out of bed, he should put his arms about the nurse's neck if able to do so. The nurse should then place one arm under the small of the patient's back, and the other under his knees, and raise him as high as possible. If the patient be very weak, an assistant should support his head and limbs. An adult patient who is seriously ill should always be lifted by several persons who should act simultaneously upon a word of command. If the patient's head is to be raised, it should be done by placing the forearm carefully under the pillow and raising the latter together with the head.

When lifting an affected limb, both hands should be extended and placed under it. When raising the upper part of the body, the nurse should take hold from in front and above, with both hands flat behind the neck and the back, and support the patient in a half-sitting posture. In the meantime

an assistant may arrange the bed, wash the patient's back, etc. Bedridden patients should be lifted frequently while the nurse looks after bed-sores in the small of the back, or places bed-pans, cushions, etc. The proper holds in such cases are shown in Fig. 372. How two persons should join their hands under the patient's back when lifting him, can be seen in Fig. 373. Many patients may be able to raise themselves with the aid of special arrangements (see Fig. 374). Fig. 375 shows the assistance rendered in laying down a patient who has been lifted.

The removal of a patient from one bed to another, even if he should be very heavy, can, with some dexterity, be accomplished even by nurses



FIG. 376. Incorrect method of carrying a patient. FIG. 377. Correct method of carrying a patient.

who are not physically strong. They must, however, avoid taking hold under the patient's armpits or under the knee-joints (see Fig. 376), and they must not stoop forward. The correct method of carrying a patient is shown in Fig. 377. This method affords security to the patient, and makes the task easier for the nurse. When moving a patient in a sitting position, the simplest method is to carry him in a chair (see Fig. 378).

When the sheet is to be changed, and only one nurse is available, she should roll up the clean sheet from both sides, and then, after removing the soiled sheet, place the clean one under the patient's back, whereafter it may be stretched to both sides by lifting first the patient's trunk and then his legs (see Fig. 379).

It is often very important to place a single limb in a correct position. The affected arm of a bedridden person rests best upon a bolster loosely

stuffed with cut straw. If the physician has ordered an elevated position, the arm or leg should be placed as shown in Fig. 380. In this instance hard and wedge-shaped bolsters are used.

Patients who are seriously ill should see as few visitors as possible. They are rarely able to do any good, and often do harm by exciting the patient. Friends frequently talk too much, and scare the patient by remarking upon his appearance, by criticizing the treatment, and by relating accounts of similar cases that took an unfavorable course, etc. Near relations often



FIG. 378. Carrying a patient in a chair.

show their grief conspicuously, or become annoying by excessive tenderness. Such conduct is obviously inconsistent with the rest necessary to the patient.

When a patient is fairly convalescent, and begins to acquire strength, it is better that he should not be absolutely idle, but divert himself with some simple occupation. The reading of carefully chosen books, which will entertain without exciting, is often a valuable pastime.

SICK-ROOM.—A room occupied by a patient should be light, airy, quiet, and comfortable.

Good air is best obtained in a dry, spacious, and thoroughly ventilated room. In winter it is advisable to open doors and windows twice a day, morning and evening, for fifteen minutes at a time. If this be not possible, fresh air should be admitted from an adjoining room, the windows of which are open. It is very practical, while airing the sick-room, to carry the patient into an adjoining, previously ventilated room. If the patient

remain in the sick-room during its ventilation, he should be guarded against drafts by placing a screen between the bed and the open window. A person who is well covered with blankets does not catch cold, particularly when only the upper parts of two opposite windows are opened, so that the cur-



FIG. 379. Changing the sheet.



FIG. 380. Elevated position of arm and leg.

rent of fresh air does not pass directly over him. During the warm summer months the windows of the sick-room may be kept open day and night.

Dust is poison to lungs and wounds, and anything that tends to collect dust (such as carpets or curtains) should, therefore, not be used in a sick-room. When sweeping the floor of the sick-room, it should first be sprinkled with moist sawdust; and the furniture should be wiped with a damp cloth.

The floor should be able to stand moisture, and for this reason it might preferably be covered with oilcloth or linoleum. In hospitals, the floors are usually made of oiled hardwood which is easily washed and dried. The spaces under the bed and other articles of furniture should be swept clean, but this should be done without disturbing the patient. It is especially important not to disturb the patient in his refreshing morning sleep. Soiled linen should be speedily removed from the sick-room.

With regard to light it may be said that a room facing east and south is most favorably situated. It is very unwise to prevent the invigorating sunshine from entering the sick-room. Blinds are of advantage only when the light disturbs the patient, as in diseases of the eyes. At night the room should be dimly lighted, preferably by a shaded electric light. Wax-candles or rape-oil-lamps are also suitable. If illuminating-gas must be used, great care must be exercised to prevent leakage. Lamp-shades (see Fig. 381) are absolutely necessary in the sick-room. Simple shades may be prepared by fastening dark paper or green cloth to the globes. Patients who are able to sit up, and who do not stand the light well, may use an eye-shade as shown in Fig. 382.



FIG. 381. Lamp with shade.



FIG. 382. Eye-shade.

Quiet is essential to the sick, and it is therefore desirable that adjoining rooms and halls be covered with carpets. Shrill bells should be muffled or removed, squeaking doors oiled, and shutters and windows prevented from rattling. Creaky shoes, noisy walking, slamming of doors and windows, the clatter of dishes, the ticking of clocks, etc., etc., disturb a nervous and sleepless patient. Unnecessary conversation in or near a sick-room should also be avoided. Whispering in the presence of the patient, or in the

adjoining halls, should be absolutely forbidden. It only tends to annoy and alarm him.

Comfort is created principally by order. This includes the maintenance of a uniform temperature in the sick-room (63° to 68° F.), especially in winter. A screen should protect the patient from the radiating heat of the stove. Only such articles of furniture as are absolutely necessary should be kept in the sick-room. These include, besides the bed, a wash-stand, a closet for clean linen and bandages (not for soiled ones), a large table, and a small bed-table on which to place such things as the patient may like to have within reach (see Fig. 384). Other requirements are: a general ther-



FIG. 383. Urinal.



FIG. 385. Bedpan.



FIG. 384. Bedside table.



FIG. 387. Bath-thermometer.



FIG. 386. Commode.

mometer, indicating the temperature of the room; a bell which the patient can use for summoning assistance when required; a medicine-spoon; a clinical thermometer for measuring the body temperature; and a bath thermometer (see Fig. 387). Patients who are obliged to attend to the wants of nature while in bed, require a urinal (see Fig. 383) and a bedpan (Fig. 385). Paralyzed or demented patients, who can not be kept clean in any other manner, should be placed on a commode (Fig. 386). For patients who soil themselves, it is advisable to have the mattress in three parts, and to have the middle part filled with chopped straw through which urine may trickle on to a trough placed underneath and communicating with a chamber. A table for eating or reading purposes (see Fig. 388), and an easy chair or a lounge provide additional comforts for the patient. Fresh flowers also tend to cheer the patient; and good books and pictures, as well as a clock that does not strike should be provided.

SIGHT, DISTURBANCES OF.—The power of vision may be affected by a great variety of disturbances, congenital as well as acquired. These may be caused by a diseased condition of any part of the eye, or they may result from deviations from the normal which can not properly be spoken of as disease. Deviations from the normal condition of refraction must be included in the latter class. The normal eye is able to perceive clearly objects near at hand as well as those at some distance, the curvature of the lens adjusting itself according to the range of vision required. At about the age of forty-five, however, far-sightedness (*presbyopia*) begins to set in, the ciliary muscle gradually losing its power to contract and to increase the curvature of the lens for near vision (see p. 70). This condition can be remedied by wearing convex eyeglasses, the strength of which must be increased with advancing years.

Long-sightedness (*hypermetropia*) is a somewhat similar condition, in which the parallel light-rays from a somewhat distant point are focussed behind the retina. The eye, therefore, has to accommodate for such rays, which subjects it to a constant strain that can be overcome only by wearing convex glasses. Long-sightedness is a congenital affection, and is frequently inherited. If nothing be done to counteract the defect, it may gradually give rise to annoying manifestations, such as headache, and pain in the eyes.

Near-sightedness (*myopia*) does not imply weakness of sight, the disturbance appertaining only to the range of vision, not to its acuteness. This condition occurs when the image of the object viewed forms in front of the retina. It may be due to various causes, the most frequent being elongation of the anteroposterior axis of the eye. The condition may be brought about by overstrain of the eyes, as by reading fine print at a dim light. The treatment of myopia includes the wearing of concave glasses; and the eyes should receive constant medical attention in order to avoid possible internal changes.

The term "astigmatism" refers to a defect of vision caused by an irregular curvature of the surface of the cornea. The defect may be congenital, or it may arise in consequence of diseases of the eye, particularly inflammation



FIG. 388. Reading-table.

of the cornea. It is frequently an accompanying feature of near-sightedness, and is best corrected by wearing cylindrically ground glasses.

Asthenopia, or weakness of vision, consists in an inability to use the eyes for any length of time without experiencing disagreeable symptoms, such as headache, pain about the eyes, the shedding of tears, vertigo, and even nausea and vomiting. The affection may arise as a symptom of some severe nervous disorder; or it may be due to a weakened condition of one or more of the muscles moving the eyeball, especially the ciliary muscle, the contractions of which adjust the curvature of the lens for vision at various distances.

Squinting (*strabismus*) may give rise to severe disturbances of sight by producing double vision. See SQUINTING.

Nystagmus is a condition characterized by twitching of the eyelids, or by spasmodic movements of the eyeball, either rotary or from side to side. It is usually the result of working in dim light, and in a stooping posture, so that the gaze is directed obliquely upward. The affection frequently occurs in miners. Nystagmus may also be the forerunner of a severe nervous trouble.

The choice of eye-glasses should never be left to the optician, for only a physician is able to make a correct examination of vision by viewing the interior of the eye with the aid of an eye-mirror; and upon this examination depends the choice of suitable glasses. Upon the first evidence of weakening eyesight, a physician should be consulted without delay. Properly selected eye-glasses can do no harm under any circumstances, but will more probably be beneficial.

For other affections of the eyes, see AMAUROSIS; AMBLYOPIA; BLINDNESS; COLOR-BLINDNESS; EYE, DISEASES OF; GLAUCOMA; HEMERALOPIA; LACRIMAL GLAND, SAC, AND DUCT, DISEASES OF; MUSCÆ VOLITANTES; NYCTALOPIA; SCOTOMA; SNOW-BLINDNESS; SQUINTING.

SIRUP.—A solution of sugar in almost equal proportions of water; that is, about an ounce of sugar to each ounce of water. It is largely used as a basis for medical preparations, to disguise the taste of obnoxious substances, to give consistency to fluids, to preserve certain drugs, or to induce children to take medicines. Among some of the more common official sirups may be mentioned: Sirup of althæa; of orange; of iron, quinin, and strychnin; of hypophosphates; of ipecac; of lemon; of tar; of wild cherry; of rhubarb; of raspberry; of sarsaparilla; of squill; of senna; of tolu; of ginger; etc.

SKATING.—This has been a favorite form of exercise from very early times, and is still largely indulged in by both sexes. As it is only possible in the winter months, when most persons are inclined to remain indoors and hug the fire, it is often recommended by physicians for the purpose of overcoming this tendency. Children become hardened by skating, and

gain a healthy color; but they must be cautioned to keep their feet dry, and, if they should get wet, to change their shoes and stockings as soon as possible. While skating, the mouth should be kept closed and respiration carried on through the nose. Smoking is not advisable; and alcoholic beverages, warm as well as cold, are to be avoided, as they only supply apparent warmth. If a person continues to feel cold even after taking a cup of hot tea or coffee, he had better go home and get thoroughly warmed. Unless there are good indications to the contrary, no one can afford to miss this beneficial form of outdoor exercise.

SKIN BLOTCHES (PIMPLES).—Red and painful nodes which develop on the skin of the nose, forehead, chin, and cheeks, and also on the back and upper part of the chest. They vary in size from that of a pin-head to that of a pea, and show either a black point or a small collection of pus. Some people allow these pimples to rupture of their own accord; others squeeze them out or open them. The pus then dries to a crust which falls off, leaving a slight scar, or merely a brownish-red spot. Some nodules harden; others suppurate, and heal with the formation of large scars; and still others give rise to the development of large numbers of blackheads which sometimes render the face very unsightly.

The affection is by no means dangerous, but it is apt to persist for a long time. Facial pimples are common in young people between the ages of fourteen and twenty-four. They are frequently coincident with the onset of puberty, and are often caused by constipation, disturbances of digestion, and by chlorosis. Treatment should be directed toward remedying any internal affections that might be present. It may be necessary also to remove the immediate cause of the pimples—an excess of fatty matter in the skin—by vigorous daily washing with soap. In the treatment of this, as in other skin-diseases, competent special advice should be sought.

SKIN, CARE OF.—From the detailed description given in the **INTRODUCTORY CHAPTERS** (pp. 18–23) it will be seen that the human skin is an extremely complicated organ. It regulates the temperature of the body and the circulation of the blood, and serves as an avenue for the excretion of consumed or harmful products. It probably plays a part also in the respiratory functions. Disturbances of the activity of the skin will bring about the most important consequences for the entire body; and what is usually designated as “general good health” depends to a great extent upon the condition of the skin.

The healthy skin has a certain uniform color, which is composed of a blending of the red color of the blood, the yellowish blond of the fine wool-hairs, and the alabaster-white tinge of the numerous microscopic scales which are constantly cast off from the horny layer. The color of the skin of different parts of the body may vary between all shades from white to dark brown. This depends upon the amount of blood contained in the

different parts, and also upon the presence of certain pigments (originating in the blood) in the deep layers of the skin. According to the character of these pigments, certain radical differences are recognized. The peculiar gloss of the skin, which is different in the different parts of the body, is brought about by fatty substances secreted by millions of minute cutaneous glands, and is modified by innumerable, very fine wool-hairs. These wool-hairs grow very close together on the so-called "hairless" parts of the body; and by their refraction of the light, they produce a soft, shining, velvety luster.

The surface of the skin being very large, it is not surprising that certain diseases (particularly those of the blood or of the kidneys) may often be recognized by reason of alterations in the appearance of the skin (see Plate XIV.). The peculiar luster of the skin in chlorosis is absolutely distinctive. It is indicative of the blood's poverty in red coloring-matter, as well as of changes in metabolism. A bluish skin, recognizable especially by blue lips and cheeks and by the bluish appearance of the otherwise white crescents of the nails, points to the presence of an excessive amount of carbon dioxid in the blood. This condition may occur as a result of deficient or impaired respiratory functions, and in sluggishness of the circulation of the blood (*cyanosis*). Bronzed skin occurs in affections of the suprarenal bodies; while a grayish color is due to excessive use of silver for internal medication, or to silver-poisoning in workmen who handle the metal. A yellowish color is produced by diseases which interfere with the discharge of bile. Malignant tumors also impart to the skin a peculiar and characteristic pallor. A peculiar, sallow paleness, combined with dryness, which gives the skin a withered appearance, and in which dark wrinkles become noticeable (particularly around the eyes), is sometimes characteristic of more or less severe nervous disturbances. The bluish color sometimes noticed on the lower eyelids is due to the fact that these parts are not provided with cushions of fat, wherefore any reduction of blood-pressure readily becomes noticeable. Such reduction of blood-pressure may be due to hunger, mental or psychic emotions, dissipation, etc. These rings under the eyes are, therefore, usually indicative of mental or bodily exhaustion. Simple fatigue may call them forth.

When the necessary fatty substances of the skin are secreted in insufficient quantities, the skin may become chapped and peel off. In very cold weather the skin is likewise apt to become brittle and fissured, either because the watery excretions are prevented from evaporating, or because the fatty substances, instead of liquefying, become hard and render the skin dry.

Frequent irritation—as by chemicals, soap, lye, warm and moist air, etc.—renders the skin red. This is particularly noticeable in the hands, where the blood supply is very abundant. In persons who have very sensitive skin, redness of the hands may be due merely to a special irritability of the readily dilatable vessels of the skin. In such cases the difference

between the temperatures of the covered and the uncovered parts of the skin suffices to cause a noticeable redness of face and hands. Distinct lines of demarcation between the white skin of the covered and the darker skin of the uncovered parts are noticed on the neck and arms of most persons.

Circumscribed red spots over covered parts of the body may, especially in children, be due to infectious diseases. Parents should carefully examine so-called flea-bites, etc., on the skin of their children, so that there may be no confusion with measles, scarlatina, or German measles. Flea-bites appear as small, red, punctiform and rounded areas, with a markedly white center and a more delicate, darkish-red surrounding. They are about the size of a pea, and are often furrowed with striped scratches. The swellings caused by the bites of bedbugs are whitish in the center, raised, much larger, and more oval in shape. Mosquito-bites form round, whitish, raised marks, surrounded by doughy swellings. In case a blood-vessel has been punctured by the mosquito's proboscis, there appears a pin-point sized red nodule under the skin, whereas the former type of swelling results when the blood is sucked through the skin. The sting of a bee immediately causes distinct swelling, with marked glistening redness. If the skin be doughy and elastic, and at the same time red, glistening, and tense, it is indicative of a local infection and inflammation. A doughy swelling extending over a large area (especially on the knuckles, or on the eyelids) points to the presence of some internal disease, more particularly of the heart or kidneys. In such cases it is necessary to have a physician make a special examination of the urine. Bright, copper-colored, tongue-shaped areas, combined with high fever and doughy swellings, is suspiciously indicative of erysipelas. Red stripes, in the form of cords, on the arms or legs, point to inflammation of the lymph-vessels. If the skin scales off in large patches, it is possibly a sign of a preceding attack of scarlet fever. Burned, blistered, or abraded parts of the skin likewise heal with desquamation.

Blisters on the skin may be due to various causes. If the formation of blisters be followed by small ulcers that will not heal, a physician should see the patient at once. So-called "miliary fever" forms white, transparent pimples, varying in size from that of a pin-head to that of a millet-seed; this affection must not be confused with more solid skin granules appearing at the eyelids (rarely on other parts of the body), and consisting of obstructed sebaceous sacs. By reason of dilatation, and blackening of their secretion, the obstructed ducts of sebaceous glands form the so-called blackheads.

Hardenings of the skin (*callosities*) are formed by circumscribed thickening of the cells of the horny layer, as a result of pressure. In this case the cells are no longer desquamated in the normal manner, but remain on the surface and form elevated layers. If the cornification of the skin be prevented by softening due to a too profuse secretion of sweat, combined with friction of the skin, abrasions will appear. These abrasions may be so deep

as to expose the nether layers of the skin; and, with the secretion of blood and lymph, they may cause painful soreness. In little children who urinate in their diapers, cleanliness is of the greatest importance, as otherwise the urine may soften the epidermis and transform a large area of the abdominal skin into a bleeding, moist surface. Callosities, or corns, are often removed by softening remedies (soap-baths, salicylic acid, etc.) and by scraping with a knife. See CORNS.

The influence of sunlight causes the development of yellowish-brown blotches (*freckles*) upon the uncovered parts of the body (face and hands). These blotches are formed by deposits of pigment, and offer great resistance to treatment. The pigment being deposited in the deepest layers of the skin, any remedy applied must first loosen the superficial layers, and then modify the coloration of the deep layer. This effect is accomplished only by very active poisons. Such treatments should, therefore, be undertaken only under the supervision of a physician. More extensive discolorations of the skin are often found in great numbers, especially on the shoulders and back of older persons. These blotches, which are slightly raised, resemble birthmarks, but are softer and flatter. Mercury salts, in strengths as prescribed by a physician, are most efficacious in eradicating them. Women with fair skin may prevent freckles by wearing a brown veil in the sunshine.

The activity of the sweat-glands is of great importance because harmful substances are generally excreted with the perspiration. The secretion of very corrosive perspiration may lead to soreness and to the formation of miliary eruption, constituting a very troublesome affection, especially of the feet. Powders containing boracic and salicylic acids are very effective remedies for perspiring feet. Perspiration of the hands, which is usually nervous in its nature, is most readily removed by improving the tone of the blood-vessels. This may be brought about by using cold and hot hand-baths alternately (see p. 166).

Rational care of the skin is indispensable, not only for reasons of attractiveness and cleanliness, but also for the preservation of health. The more one bears in mind the needs of a uniform activity of the entire skin, the nearer will one be to the natural requirements of proper care of this organ. The skin may be trained to accommodate itself rapidly to changes of temperature, maintaining at the same time the usual heat of the body. This can be accomplished by systematic exercise of the blood-vessels of the skin. Systematic exposure to the influences of the air is one of the best forms of gymnastics for these blood-vessels. The body is exposed much oftener to air changes than to the effects of moisture. One should, therefore, accustom the body to endure exposure to air-currents of widely varying and rapidly changing temperatures. The muscles of the blood-vessels of the skin may be exercised also with cold water; but this procedure requires caution, for

only those who obtain a healthy reaction after a cold douche are benefited by such a mode of treatment. Hot baths are greatly misused, and may cause much harm. A hot bath causes an overaction of the heart equivalent to that caused by a long walk in mountainous regions. Air-baths at varying temperatures accomplish vastly more for the blood supply of the skin than do water-baths.

Cleanliness is an indispensable hygienic measure if one would take proper care of the skin. Not only the dirt which unavoidably accumulates on the skin must be removed, but also the secretions and scales of the skin itself. This cleansing may be satisfactorily accomplished by washing with soap and water. Soaps used on the skin should be neutral; that is, they should contain neither free acids nor free alkalies.

SKIN, DISEASES OF.—The skin being easily accessible to the eye as well as to the palpating finger, changes in its appearance are readily observed even by laymen. Many such changes are not due to skin-diseases proper, but are either temporary or long-lasting symptoms caused by internal affections (chlorosis; cyanosis; silver-poisoning; etc.). See SKIN, CARE OF.

True skin-diseases may be caused by various harmful influences, such as by great heat or severe cold, by excessive dryness or moisture, by chemical substances (corrosive acids, blistering agents, etc.), by bacterial infection (smallpox, measles, scarlatina, syphilis), and, finally, by fungi and parasites. Since infectious and non-infectious skin-diseases very often resemble each other very much, even at times being exactly alike in appearance, it is always advisable to call a physician as quickly as possible. Delay in obtaining professional treatment is often the cause of a disproportionately long duration of the disease. "Critical eruptions" in the sense of the hydrotherapists, as if the affection were driven from the interior of the body into the skin, do not exist. Eczema and itching herpes may arise in consequence of (usually exaggerated) applications of water.

Eczema is an inflammatory, non-contagious affection of the skin, and is often caused by gastric or intestinal disturbances, or by nervous disorders. It may be brought about also by great heat or cold, by the action of chemical agents (acids, etc.), and by parasites. Its course may be acute, but is more frequently chronic. The disease has been called also "running tetter," because it is usually attended with the secretion of a serous fluid. The eruption may occur in the form of vesicles, fissures, crusts, scales, pustules, or simple redness. Treatment consists in strict regulation of the diet, attention to the causative factor, and local applications (antiseptic powders, ointments, or washes).

For other affections of the skin, as well as for some of the more common diseases attended by skin eruptions, see the following articles: BIRTH-MARKS; BLACKHEADS; BURNS; CHICKEN-POX; CHILBLAINS; CORNS; CYANOSIS; ELF-LOCK; ERUPTION; ERYSIPELAS; FAVUS; FISH-SKIN DISEASE;

FREEZING; FURUNCLES; GERMAN MEASLES; HARVEST-TICK; HERPES; HIVES; INFLUENZA; INSECT STINGS AND BITES; ITCHING; LICE; LUPUS; MEASLES; NOSE, RED; PRICKLY HEAT; PURPURA; RUNROUND; SCABIES; SCARLATINA; SHINGLES; TETTER; VARIOLA (SMALLPOX).

A rule which is generally applicable for the treatment of skin-diseases can not be given. Even a simple bath may be harmful. Dusting with rice-powder or zinc-powder is harmless, and may prove beneficial until the physician arrives.

SKIN, FOREIGN BODIES IN.—Foreign bodies which have entered the skin should be removed at once; and the wound caused thereby should be kept clean until it has healed. If the foreign object (splinter, needle, etc.) has entered too deeply to be removed by the injured person himself, medical assistance should be obtained. Fish-hooks, embroidery needles, or other barbed instruments which have penetrated the skin so that they can not be withdrawn without causing a large wound, may sometimes (especially when caught in a finger or in the margin of the hand) be removed by pushing them through until the barb can be broken off on the other side, when the shank may be readily withdrawn. Foreign bodies which have entered the tissues so deeply that they can not be felt, may be located by the aid of the Roentgen rays (see Plate XV. 1 and 2; also Fig. 70).

SKIN, SCALING OF.—The skin is constantly being renewed, the outer layer being gradually cast off in the form of scales. Under normal conditions this scaling process may be observed only on the arms and legs, and then as a rule only when the skin has been insufficiently cleansed. After an inflammatory or eruptive affection of the skin, a more rapid renewal of the epidermis takes place, either as soon as the inflammation has subsided, or during the stage of eruption. This process usually includes the entire body, and may occur in the form of fine, branny scales, as in measles, or large flakes, as in scarlet fever. Dandruff is characterized by the formation of a scurf which comes off in fine scales. In scaly tetter, or *psoriasis*, the desquamated material is thrown off in the form of large adherent scales. Another variety of scales consists of dried bits of epidermis mixed with the fatty secretions from the skin. These may be small or large, in the latter case forming fatty masses of a dirty gray color. It must not be forgotten that the desquamation which occurs during or after a contagious disease is liable to disseminate the infection.

SLEEP.—The brain, the organ of the mind, rests during sleep. Mental activity, however, is not entirely suspended, as is frequently assumed, but is merely greatly diminished. Even persons who are profoundly asleep remain susceptible to external effects; if this were not the case they could not be awakened. Nor has it as yet been fully established whether or not an absolutely dreamless sleep can occur. An individual aroused from a sound slumber may recall parts of a dream; and in cases where one believes his

sleep to have been dreamless it may be due simply to his having forgotten the dream. See DREAM.

The causes of sleep are not fully understood. Many investigators believe that some metabolic secretion is conveyed to the brain by the blood-current, acting as a narcotic upon that organ. Others regard a deficiency of oxygen as the cause, believing that a period of rest is necessary in order to accumulate a new supply of oxygen to compensate for the greater amount expended during the waking hours. Experiments on animals are believed by some to have demonstrated that the delicate terminations of the cerebral nerve-cells are retracted during sleep, thus interrupting the connections between the cells, and thereby impeding the normal course of thought-activity. This fantastic neuron-retraction hypothesis, however, is not seriously considered by thinking men. The general opinion, that sleep is the natural outcome of fatigue, is not always correct. A person may fall asleep without being either bodily or mentally fatigued; and, on the other hand, great exhaustion may render one sleepless. It is possible, also, to overcome sleepiness in spite of great exhaustion. Finally, sleep itself causes drowsiness, as every one has experienced on awaking in the morning.

Sleep is induced by the absence of external sense impressions. The stillness of the night, the darkness, and the reposeful position of the body are all conducive to sleep. Monotonous sounds—such as the ticking of a clock, the rippling of a brook, or a tedious sermon—have the same effect. To cultivate the habit of going to bed every night at a fixed hour is advisable.

An empty stomach may prevent sleep as effectually as an overfilled one. Hence the customary advice, to go to bed on an empty stomach, requires modification. Sleep is most profound during the first few hours; it then becomes gradually lighter, and for several hours before awaking it remains almost uniformly light.

The conditions of sleep and wakefulness can not always be sharply demarcated from one another. When a person is half asleep, the images of his dream combine with actual sense impressions, thus falsifying reality. The state of being sleep-drunk is an illustration of this. Sleep-drunkenness is a condition following very heavy slumber. The person does not awake rapidly, but is roused only gradually and imperfectly. He is, therefore, apt to confuse the pictures of his dream with his actual surroundings, and may even commit deeds of violence against his friends because he confounds them with his dreamy visions. Such occurrences, however, are very rare in healthy individuals. Sleep-drunkenness is a term which may more properly be applied to a form of automatism occurring in epilepsy, in which partial consciousness is present. A different condition is that known as NIGHTMARE, which is in no wise related to epilepsy. As to sleep-walking, see DREAM.

Regarding the hygiene of sleep, it is advisable to have a large and airy bedroom, and to sleep with the windows open, especially in summer. The "harmfulness" of night-air is imaginary. During winter more caution is necessary. It is not advisable to sleep in an ice-cold room; and when the temperature of the bedroom gets below 55° F., it is best to heat it. Regarding the proper condition of the bed, see the article on BED. Adults require about seven hours sleep daily; children up to four years of age, twelve hours; children between four and twelve years old, nine hours; young people, eight hours. Sleeping in the middle of the day is unnecessary for healthy adults, and may even be harmful.

SLEEPINESS, EXCESSIVE.—A rare condition which may arise in severe diseases associated with alterations of the blood, especially in febrile affections. It may occur also in consequence of injury to the skull, or it may be due either to increased blood-pressure in the brain or to an insufficient blood-supply to that organ. Various forms of poisoning, as well as cerebral affections, may likewise give rise to the condition.

Persons who are unable to sleep at night often fall asleep every few minutes during the daytime. Individuals of an advanced age are especially subject to somnolence. In these cases the affection is generally due to hardening of the small blood-vessels of the brain (*arteriosclerosis*). A special disease, called the "sleeping sickness," is found in Africa. This is due to a parasite which is conveyed to man by the bite of certain flies. The parasite is thought to be a form of low animal, a *trypanosoma*. Sleeping sickness is an extremely fatal disease. See TROPICAL DISEASES.

SLEEPLESSNESS (INSOMNIA).—Pains of various kinds, anxiety, shortness of breath,—in fact, all physical and mental affections—may disturb sleep. Sleeplessness is a consequence of the prevalent ailment of civilized mankind, namely overirritation and exhaustion of the nerves (*neurasthenia*). To ascertain the cause of the condition is the first step toward cure.

Sleep is so absolute a necessity to the exhausted body, that a person tormented by insomnia is tempted to make use of any remedy, without consideration. Such patients should, therefore, be most emphatically cautioned against the use of narcotics, especially against such as contain opium. Sleep-producing remedies should be taken only in accordance with a physician's directions.

Nervous sleeplessness affects principally the serfs of mental labor and the slaves of competition. It is rare that a manual toiler, a soldier in the field, or a servant-girl complains of insomnia. The best advice that can be given to persons thus affected is, therefore, to induce bodily fatigue by working in the field or in the garden, by chopping wood, or by taking gymnastic exercises. Care should be taken, however, that the thing be not overdone.

There is a number of aids which may be employed in the fight with

insomnia. A simple early supper, without strong tea or coffee, and without alcoholic beverages, is at times advisable. The "nightcap" has caused many persons to become habitual drunkards. A person suffering from sleeplessness should avoid late hours (theater or evening parties), exciting reading-matter, strong drinks, and games of chance. He should try to go to bed early and to rise early, to banish sleep in the morning and force the body to fall asleep earlier in the evening. A walk of half an hour before retiring is advisable. If the patient lives in noisy surroundings, he should place cotton-pledgets greased with vaselin in his ears during night.

The bedroom should be dark and well ventilated, and the bed should be placed so that the patient's head looks away from the light. The pillows should be so arranged that the head rests horizontally, or bent slightly backward. A warm sponge-bath of the entire body before retiring is often effective in inducing sleep. If this be not sufficient, a full body-bath of 95° to 104° F., lasting from 25 to 40 minutes (according to the physician's directions), may be taken. This is especially to be recommended for children who are very excitable.

A great many people are unable to sleep owing to constant thinking. They ponder over their business affairs, their plans, their fancies, or their passions. If these persons were able to get rid of their exciting thoughts, they would fall asleep readily enough. These patients should take their troubles to a physician who has had experience in such psychic troubles. One should always remember the words of a celebrated Swiss physician: "Sleep is like a pigeon: should one attempt to catch it, it flies away; but pay no attention to it and the bird lights upon your shoulder." This is very often true. The harder one attempts to induce sleep by rules of breathing, of repeating things, of counting, etc., the more persistently does sleep keep away. Forget the fact that one is awake, and think of pleasant scenes, of hopeful prospects—build castles in Spain if one will—and sleep suddenly descends.

SMALLPOX.—See VARIOLA.

SNAKE BITES.—Poisonous snakes cause the death of over 20,000 people a year in India; and the tropics generally have more poisonous snakes than have the countries of temperate climates. In the United States there are but few poisonous snakes, the vast majority of our snakes being harmless. In vipers, or members of the Crotalidæ, the United States is well represented. The rattlesnakes are the chief poisonous snakes belonging to this group, there being at least seven of these in all. The banded rattlesnake, *Crotalus horridus*, is the most widely distributed, being found from the Atlantic to the Rocky Mountains and as far north as Canada. The *diamond rattlesnake* is found in Florida and the south, while the *prairie-rattler* is found in the Mississippi Valley and in the regions between the Mississippi and the foot-hills of the Rockies. The *ground-rattler* is the

smallest of these snakes. The *copperhead* also belongs to this group, and is found chiefly in the southeast, coming fairly far north in certain localities; while the *moccasin* is plentiful in the south, particularly in the rice-fields. In the south there is also a poisonous coral-snake, the *Elaps fulvius*. The *heloderm* is a lizard, not a snake. In the West-Indies and in Central America other forms are found.

All snakes have a double row of teeth which are more used to aid the snake in swallowing food than as weapons of offence; but the rattlesnakes, and all vipers have a pair of fang-like teeth which take the place of what are termed the palatine teeth. In the vipers these teeth are movable, lying back when the snake is not aroused, but raised erect when the reptile is in action. In biting, the snake makes a quick dart, rarely moving over one-third to one-half of its length, and sinks its fangs, perhaps its teeth as

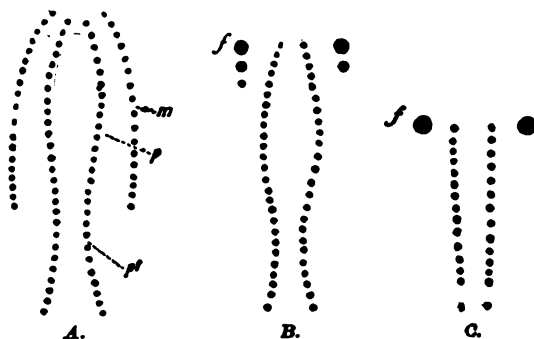


FIG. 389. Impressions of the teeth of snakes.

A, harmless snake; B, cobra; C, viper. f, fang; m, maxillary, p, palatine, pt, pterygoid teeth.

well, into the object aimed at. The imprint has been described as typical of the snake-biting, as the accompanying cut (Fig. 389), reproduced from Langmann's article in *Wood's Reference Handbook of the Medical Sciences*, shows; but this is largely accidental. In the vipers there is a channel in the fang, which leads up to a poison pocket; and as the snake bites, the contractions of the muscles of the jaw force the poison into the wound. This poison is a very interesting substance. Unlike the other secretions, which are alkaline, it is strongly acid, and in each species of snake it has a characteristic odor. Thus, Langmann speaks of the odor of rattlesnake-venom as "mousy." It is a pale straw-colored or dark orange liquid, with a high percentage of solids. On drying, the snake-venom forms a light, brownish, translucent scale. The venom is sterile when fresh. Chemically, snake-venom is a very complex substance. It is very stable, for dried venom has been kept for twenty to twenty-five years without losing any of its poisonous properties. The poison of venomous serpents kept in alcohol for years still remains active. It is thought to be a mixture of peptone and globulin-like substances, although certain facts are known which render it possible that the poisonous principle is not a proteid at all.

The effect of the bite of a venomous snake varies considerably in different individuals bitten, largely because of the variations in the amount of poison injected. The poison is capable of very rapid absorption when injected, first entering the connective tissues and thence passing into the

blood. The poison of the rattlesnake does not seem to pass rapidly through mucous membranes. This fact renders it comparatively safe to try to suck rattlesnake-poison from a bite after a free incision has been made. The symptoms of poisoning also differ according to the snake that does the biting. After a cobra-bite, which shows two small dots of puncture of

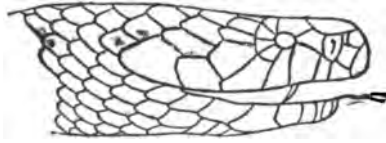


FIG. 390. Head of cobra.

the fangs, from which a burning pain spreads out, the patient in about an hour commences to feel a distinct sensation of giddiness and vertigo. Then weakness develops, the gait becomes staggering, and finally the patient is unable to stand

up from paralysis of the legs. Other muscles are also involved. The eyelids droop, the jaw falls, swallowing becomes difficult. There is nausea and vomiting, and slowed respirations leading up to cessation of breathing; the heart continuing to beat some time after respiration has ceased. Convulsive movements may occur. In a large number of instances death takes place in a few hours, but may be delayed for fifteen or eighteen hours. In non-fatal cases recovery is apt to be rapid, and there are few after-effects.

The results of a rattlesnake-bite are very different. There is an initial pain with swelling and burning, but an additional bloody discoloration at the site of the wound. The symptoms develop in about fifteen to twenty minutes, discolorations appearing in the skin and mucous membranes both before and after the onset of the constitutional effects. There is a sense of great prostration, with nausea, vomiting, and a very marked increase in the rapidity of the breathing. The blood-pressure falls, the pulse becoming very soft, and the breathing then becomes slow and snoring. Symptoms of irritation, such as convulsions, may occur, especially if the dose has been large; this is followed by muscular weakness developing into complete paralysis, as with cobra-poison. Death usually takes place within twelve hours, and signs of multiple hemorrhages in the tissues of the body are numerous. Albumin and blood appear in the urine. Recovery may be rapid, but is frequently complicated by abscess-formation in the hemorrhagic areas.

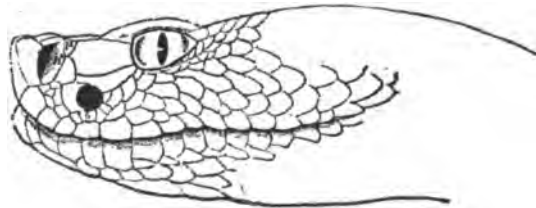


FIG. 391. Head of rattlesnake.

The poison of the rattlesnake acts both upon the blood and on the nervous tissues, leading to destruction of both classes of cells. "Neurolytic" and "hemolytic" are the descriptive terms used in modern toxicology to signify this type of poisoning. Langmann, in summarizing the effects of snake-

bite, says that the cause of death, "if taking place within a few hours, is thrombosis (coagulation of the blood in the blood-vessels); a patient who dies within twenty-four hours may succumb in the first few hours to respiratory paralysis, later to general paralysis; death occurring after a considerable lapse of time, days or weeks after a bite, may be the result of sepsis or of general prostration following prolonged suppuration."

The treatment must be prompt. The member bitten must be cut off from the general circulation as rapidly as possible, a tight band, preferably a rubber band, being immediately placed about the arm or leg above the point of the bite. The underwear may be torn to provide a band. Sucking is not of much value unless the wound has been laid bare with a knife. Indian physicians advise cutting out a large piece of tissue, and thus limiting the amount that can be absorbed. As to the use of alcohol it is highly improbable that it is of much value; large amounts are certainly more prejudicial than helpful. Its chief use seems to be in deadening the sense of alarm and despair of the bitten person. Strychnin has been used, but has not been definitely demonstrated to be a specific. In recent years anti-venom serums have been used in experimental work to advantage.

SNOW-BLINDNESS AND EFFECTS OF COLD.—Every one is familiar with the primary stimulating and invigorating effect of cold, and how under the influence of the stimulus the eyes become brighter, the cheeks reddened, the pulse-rate increased, and a general sense of mental exhilaration and well-being is created. Let, however, the cold be sufficiently intense and the exposure sufficiently long, and symptoms of depression soon manifest themselves, by pallor, difficulty of breathing, drowsiness, coma, and death.

The predisposing causes to frost-bite, chilblains, and the ill effects of cold in general are: intemperance in the use of alcohol, inanition, improper or insufficient food, occupations which involve prolonged exposure without the exercise necessary to maintain the circulation, etc. Of constitutional causes, the lymphatic temperament predisposes to frost-bite and chilblains.

Snow-Blindness.—Trappers, prospectors, lumbermen, and others who are exposed to the intense glare of the sun and strong reflected light from the snow in northern latitudes, frequently suffer from a peculiar affection of the eyes, called snow-blindness. It usually manifests itself quite suddenly by swelling and redness of the eyelids (*chemosis*), redness of the conjunctivæ, profuse flow of tears, extreme sensitiveness to light, and a gradual loss of sight. This loss of sight is due to haziness of the cornea, and to a loss of color perception. The snow-blind individual is blind only in the sense that he perceives white light, and dimly the forms of objects. March is the month in which snow-blindness is most likely to occur, because of the greater power of the sun, and because the system is more or less debilitated by a long winter and the want of fresh vegetables. It is particularly common in Alaska and the northwest provinces of Canada.

To prevent snow-blindness the eyes must be protected by goggles. From time immemorial the Eskimos have worn wooden goggles to protect the eyes from the glare. They are made of thin pieces of carved wood, provided with slits which enable the wearer to see. They are usually blackened on the inside, and some are provided with a sort of peak to give additional shade (see Figs. 391 *A* and *B*). Smoke-colored glasses are to be recommended, although they do not serve the purpose as well as do the wooden shields. The absence of a peak greatly lessens their usefulness, demonstrating that the direct rays play a more important part than the reflected rays in producing snow-blindness. The use of lime-juice is likewise important, as observations have demonstrated that the absence of vegetable food and acids plays an important rôle in the production of snow-blindness.

Relief from the local pain and discomfort can be obtained by bathing the eyes in a solution of equal parts of distilled extract of wick-hazel and warm water; or in an infusion of poppy-heads made by breaking up four poppy-heads, place them in a covered vessel, steep for ten minutes in a pint of boiling water, and strain. Other forms of treatment, with weak solutions of cocain or atropin, should be left to the physician, as these drugs may do incalculable injury if used incautiously. If the patient is greatly debilitated, a moderate amount of stimulant should be given, especially in the form of port-wine negus or egg-nog.

Persons who have suffered from snow-blindness are much more liable to subsequent attacks than others, if great care is not exercised. The acuteness of vision may remain impaired for a long time, even for years, and the eyes are easily fatigued when used for near work.

Chilblains.—The mildest form of ill effect from exposure to cold is called *chilblain*. It is particularly liable to affect young girls of a lymphatic or strumous temperament, and manifests itself on approaching a hot fire or entering a warm room after exposure to cold. The hands or feet at first look very pale, and then an eruption of violet or dull red patches appears. These patches are slightly raised above the surrounding surface, are irregular in shape, and are attended by severe itching and burning. Vesicles form, which on becoming eroded develop into sluggish ulcers with white edges, attended by a slimy discharge. Cracks and fissures which are very painful and difficult to cure, may also form, often becoming chronic, or recurring on slight exposure.

Persons who are subject to chilblains should be careful to avoid exposure to cold without sufficient clothing. Warm, lined gloves should be worn, and the feet should be encased in lined overshoes. On entering a warm room after exposure to cold, one should be careful not to approach a fire; and if the hands or feet are numb and cold they should be bathed in cold water or rubbed with snow. If chilblains appear, the old-fashioned remedy of brandy and salt (two tablespoonfuls of brandy and a large pinch of salt)

may be used. More fully developed chilblains may be painted with compound tincture of benzoin or with tincture of iodine. Many physicians prefer a 1:100 solution of carbolic acid. If the part is very painful and inflamed, lead and opium lotion will give relief. If the chilblain is sluggish and becoming chronic, dilute citrin ointment or resorcin ointment should be applied. The part should be wrapped in absorbent cotton and kept from the air.



FIG. 391 A.—Wooden snow-goggles.

Frost-Bite.—This is a more severe form of interference with the nutritive processes as the result of exposure to low temperatures. The extremities (hands, feet, fingers, toes, nose, ears, and cheeks) are the parts most commonly affected. Occlusion of the capillary circulation, with interruption of the nervous and nutritive processes, if not relieved, may lead to gangrene, and sometimes to death by septicemia.

When a part is frozen it becomes white, stiff, shrunken, and parchment-like. If submitted to the influence of heat it becomes discolored, first blue, then purple, then black, and gangrenous. If the part is frozen very hard it may be broken off when handled; care should, therefore, be exercised in dealing with such a case to handle it gently. As soon as reaction sets in, the part becomes red, hot, and swollen; and if the arrest of the nutritive and nervous processes is complete, a line of demarcation is set up, separating the dead portion from the living tissue. A slough is formed, and the frozen or dead portion will drop off; but as the surgeon is usually called upon to intervene, amputation is performed. Cases are recorded where it has been necessary to amputate both hands and feet on account of frost-bite.

Slighter forms of frost-bite are characterized by whiteness, loss of sensibility, and stiffness; followed by reaction which is indicated by redness, swelling, tenderness on pressure, vesication, and the formation of a scab of varying thickness which, when healed, leaves a bluish discoloration. Parts which have been frost-bitten remain sensitive for a long time, and are more easily and quickly affected, even for years after.

General Congelation.—If the formation of internal heat is not kept, there is a gradual abstraction of heat when one is exposed to severe cold. Soon painful burning and pricking sensations are experienced in the extremities. The joints feel stiff, and there is a general feeling of numbness, and



FIG. 391 B.—Goggles as worn.

dull, aching pain. The person becomes irresistibly drowsy and indisposed to exertion. Should this not be combated, the individual passes into a deep sleep ending in coma and death. The blood recedes from the surface, and accumulates in the internal organs. The circulation of the blood slackens, respiration becomes labored, and the patient either becomes asphyxiated from congestion of the lungs, or the blood is driven to the brain, causing apoplexy. In the latter case the patient dies very suddenly.

Cold-Stroke.—Dr. Hartshorne of Philadelphia has described an effect of cold which has been named *cold-stroke*, because of the train of symptoms caused by sudden exposure to low temperatures. For example: A fire broke out during a cold wave, and a boy threw open a window and stood in the draft to watch it. Next morning he complained of severe headache, dizziness, vomiting, and general indisposition. His temperature rose, the pulse-rate increased, he became delirious, and spasmodic contraction of the fingers and of the muscles of the jaws took place. These symptoms were followed by cold sweats, weak and intermittent pulse, and death.

Treatment must primarily be directed toward restoring the circulation and reestablishing the nutritive processes. If a part has been frozen for some hours before the circulation is restored, its death will result, because the vessels have become permanently occluded and the functions of the nerves destroyed. The part must first be vigorously rubbed with snow, the patient remaining outdoors or in a cold room. He should then be bathed with ice-cold water, the temperature of which should be raised very slowly. After that, some stimulating lotion, such as camphorated oil or compound soap liniment, may be used. When reaction takes place, local inflammation may occur, as shown by swelling, redness, heat, and tenderness. The part should then be painted with tincture of iodine, or with compound tincture of benzoin. Superficial ulceration is best treated with an ointment of ichthyol (one part) and vaselin (three parts); or with benzoated collodion. If a slough forms, it should be poulticed with slippery-elm bark or linseed meal, and the part dressed with carbolized oil. The part should be kept from the air by wrapping it in absorbent cotton and oiled silk, which should be held in place by a gauze bandage.

SOAP.—A combination of an alkali and an oil, as soda or potash and olive-oil. In medicine it has various uses beside prophylaxis. Soap-suds make a very effective enema, and are sometimes used in connection with turpentine and olive-oil. A common and simple method of moving a child's bowels is by the use of a soap suppository. Soap-liniment is often used in the treatment of sprains and bruises; and it forms the basis of numerous other liniments. A surgical adhesive plaster, known as soap-plaster, contains lead oleate, resin, and soap. Soap is used internally as an antidote for poisoning by any of the acids.

SODIUM, SALTS OF.—Sodium is a soft, silvery white metal, the salts of which are employed in medicine to some extent. Most of these salts act in a manner similar to those of POTASSIUM (which see), although to a somewhat milder degree. *Sodium carbonate* is the common sal soda or washing-soda of commerce. *Sodium bicarbonate*, or baking-soda, is derived by the action of carbon dioxid on sodium carbonate, and occurs as a white, crystalline, compound powder. Mixed with an acid substance, as cream of tartar, it is used in cookery for raising cake, etc. Its chief use in medicine is as an antacid in cases of gastric acidity giving rise to belching or flatulence. The dose is half a teaspoonful or more, given in a glass of water. *Sodium hypophosphite* occurs in small, clear crystals. It is used together with other hypophosphites in a compound sirup, and is also given alone in some cases of nervous disturbances. *Sodium bromid* is used as a nerve-sedative. *Sodium salicylate* is of importance in the treatment of rheumatism, gout, etc., and is used also as an intestinal disinfectant.

Sodium chloride, or common salt, does not pass easily through a membrane. If, therefore, blood-cells are placed in a solution containing more salt than the normal fluid of the blood, the cells will give up some of their water and shrink in size. If, on the other hand, the solution contains less salt than normal blood-serum, the cells will take up water from the solution, swelling up and becoming globular. A watery solution of salt which is isotonic with blood-serum and blood-cells is called a normal salt-solution. Such a solution is about 0.6 per cent. in strength, and in it body-cells can retain their form and vitality. Plain water, or a concentrated solution of salt, for the reasons given above, prove irritating to exposed tissues; while a normal salt-solution serves as a very bland, unirritating wash. Sodium chlorid has practically no effect on the tissues other than this physical action. Normal salt-solution can therefore be injected into the veins in large quantities without any untoward effects. This fact is utilized when it is desired to increase the amount of fluid in the body rapidly, as after severe hemorrhage, or in surgical shock, when the blood-pressure is dangerously low. It may be injected under the skin or given by rectum. It is used, with or without bleeding, to dilute poisons in the blood and stimulate their excretion, as in uremia, gas-poisoning, etc. Neither salt nor water is absorbed through the skin, and salt baths are of service merely as they cause a certain amount of reflex stimulation by a slight irritation and by the pressure. Concentrated salt-solution injected into the rectum, acts efficiently as an enema. A teaspoonful or so taken by mouth acts as an emetic, and is often given in cases of poisoning. The strong solution is efficacious also as an antiseptic wash, especially as a mouth-wash in cases of foul breath.

SOIL, THE.—All living things are composed of substances originally derived from the earth; and after death all the component parts of the

organism return to the earth through the processes of decomposition and disintegration. The bacteria of decomposition, which are normally present in the soil, play an important and useful rôle in breaking up this dead organic material.

Such decaying substances in the soil may, however, exert a harmful influence on living human beings, by producing exhalations of unhealthy gases, by foul odors, and by poisoning the water intended for household purposes. Under certain circumstances, particular danger may result from the presence of the bacteria of various infectious diseases, such as typhoid, cholera, tetanus, anthrax, etc., which may remain in the superficial layers of the soil for considerable periods. The living human body may become infected with any one of these diseases, either directly or through the medium of food. The air which is present in the soil may also find its way into human habitations; and if it be contaminated by poisonous gases, it may constitute a serious menace to health.

In a similar manner, moisture may be communicated to dwellings, the water being absorbed by the walls; and it is, therefore, very unhealthy to live in houses which are built on damp soil, or which have not been thoroughly dried before being inhabited. In cities, the best way to purify and thoroughly dry out the soil is by a complete system of drains and sewers.

SOMNAMBULISM.—See DREAM.

SPANISH FLY.—See CANTHARIDES; DOMESTIC REMEDIES.

SPASM.—A muscular contraction which is not brought about by the influence of the will. When a muscle contracts involuntarily, and remains contracted for some length of time, the spasm is termed *tonic* or rigid. If, on the other hand, repeated contractions and relaxations occur at brief intervals, the spasm is called *clonic* or convulsive. These spasms are due to some form of irritation in the cortex or other part of the brain, in the spinal cord, or in the nerve or muscle itself. Many cases of poisoning are accompanied by spasms; for instance, strychnin-poisoning, hydrophobia, and lockjaw.

Spasms of the muscles of the neck are among the most frequent. Fig. 392 illustrates how such a spasmodic contraction of the neck-muscles causes the head to be twisted toward the affected side. A form of spasm which involves certain muscles in the neck is very obstinate. Every few minutes



FIG. 392. Spasmodic contraction of the neck-muscles, causing the head to be inclined to one side.

the patient jerks his head toward the affected side, and makes a convulsive movement with the corresponding shoulder. The symptoms usually become aggravated when the patient feels himself observed. This affection is often refractory to most forms of treatment. Nodding spasms occasionally occur in children, especially during teething.

Clonic spasms of the diaphragm gives rise to the well-known condition termed "hiccup." By holding the breath for a short while, or by diverting attention from the affection, it soon passes away. Hiccup is a bad prognostic sign when occurring in severe diseases, such as cerebral affections.

SPEECH DISTURBANCES.—Existing disturbances of speech may be more readily understood by a short survey of speech development in the child. This may be divided into four periods.

(1) **The screaming period.** Screaming is closely related to speech, since it is the child's only utterance during the first period of life; and so far as the manner of breathing is concerned, it is very similar to that employed when speaking. Whereas the child breathes through the nose when quiet, it inhales rapidly through the open mouth when screaming, and exhales in long-drawn periods, at the same time vocalizing.

(2) **The babbling period.** During the third or fourth month children begin to feel in sympathy with their surroundings, and show this by grasping with the hands and struggling with the feet. They also make all kinds of sounds which as yet have not much similarity to later sounds of speech, such as "mama," "dada," etc., and others which are made with those parts of the mouth which have become strengthened from suckling. These first sounds uttered by the child are often regarded as real speech, and that is why the syllables mentioned above are supposed to stand for the names "father" and "mother." For this reason the same sounds are found to stand for the parental names in widely different languages.

(3) **The imitative period.** When the child begins to reach a higher stage of mental development, it not only hears but listens, and not only sees but observes; and together with this strengthening of the power of its senses, increased by attention, there awakens an imitative instinct. The child endeavors to imitate, as far as lies in its power, what it sees and hears. When the child says "mama" and "papa" at this stage of its development, it means much more than the babbling of these same sounds at a previous period. It is now a conscious process. The child can not reproduce all sounds as yet; some are learned with much difficulty. Many children learn to pronounce "k" and "g" very late; and instead of "come" they will say "tome," instead of "God," "Dod," etc. It is unwise to speak baby-talk to a child, for the child needs a good example or it will remain at a low stage of speech development for a long time. It will pronounce faultily and stammer; for stammering is really a form of faulty pronunciation, as well as faulty breathing. As with "k" and "g," so the child often finds difficulty with "s," "ch,"

and other difficult sounds. A child is at once impressed with any unusual sound, and will try to imitate it; it should therefore be kept away from stammering people. Some children, after being a short time with stammerers, begin to imitate their manner of speech, and gradually develop the habit. It was an old Roman orator who advised all parents to bring their children in contact with persons who spoke correctly. It is a well-known fact that mistakes made by nurses are very often adopted by the developing child.

(4) **The actual period of talking.** Having learned sufficiently how to use its speaking-mechanism, the child now begins to give expression to its own thoughts. It must be remembered that the child understands the speech of its surroundings very early—in fact much earlier than it is able to imitate it. The understanding of words is developed much earlier than the ability to form words. There is, therefore, a disharmony between the two processes; and, not being able to use its speaking-mechanism with certainty, the child is often unable to give expression to its thoughts. It will often halt, and repeat first syllables of words; and in the case of nervous children who have an inherited tendency to faulty speech, there is danger that this may develop into habitual stuttering.

From this short survey it may be seen that there are important causes for the acquirement of faulty habits in the speech development of the child. In most cases parents can, at this early period, prevent the development of such disturbances by sufficient watchfulness over the child. In any case, if anomalies are noticed, one should not be content to let them “improve with time,” but should apply the necessary correction. This consists in always talking slowly and very distinctly to the child, accustoming it to repeat slowly what was said; and teaching it the meaning of words, if necessary, with the aid of picture-books.

The period of speech development in children is of variable duration. Generally speaking, boys learn to talk later than girls. Under normal conditions one may expect a child of three years to be able to talk. But very often there are delays, and occasionally really bright children of five or six years of age are unable to speak plainly.

Deaf-mutism is a peculiar form of speech disturbance, which is to be regarded as an arrested development of speech, to differentiate it from congenital deafness. If the child be otherwise bright, deaf-mutism can be cured with certainty by careful education under the supervision of a specialist. It is well to attempt this in the fifth year. To wait longer retards the child's progress at school and affects its later mental development.

Muteness is frequently found in children as a consequence of inhibitory irritations. Children fall sick so easily, for instance from intestinal irritation; and it has been observed that children have become dumb from gorging themselves with cake, and have not regained the faculty of speech until

after vomiting. Furthermore, cases have been reported where children who had spoken fluently have lost the power of speech because of the presence of worms, and not regained it until after the removal of these parasites. These causes must therefore be borne in mind when children remain mute for a long time. Adenoid vegetations are frequent causes of delayed speech.

Stuttering and stammering are the most frequent and most wide-spread anomalies of speech. Stuttering denotes a spasmodic disturbance which causes an arrest of the flow of language, by repetition of sounds and syllables, by repression of the voice, or by faulty breathing. The stutterer also makes grimaces; at times he stamps with his feet, throws his hands about, and distorts and turns his body, all in order to overcome his impediment. Stuttering is frequently a family failing, so that the child may have a predisposition to it. But as has been said, it often occurs as a result of imitation. Usually it is caused by undue haste in an attempt to say something quickly. It rarely results from a blow on the back, or from a beating or fall, as some persons suppose. The treatment is to be left to the physician. As stuttering children are often scrofulous and suffer from rickets, medical advice must be governed by the existing condition. Eating too much meat often makes children nervous, or aggravates an existing nervousness, causing speech disturbances. In such cases it is necessary to regulate the diet, choosing a vegetable fare in preference to a more stimulating one. It is not a rare occurrence for such a change in diet to cure stuttering. But the main thing is to guard against stuttering from the very beginning. If it has developed, one should begin treatment immediately; the longer the delay, the more difficult it becomes to cure the affection. Treatment should, if possible, be begun before the child goes to school. If stuttering only begins at this time, the child should be taken from school until cured, even at the expense of its education; it should be spared the psychic excitement produced by its affection, which is aggravated by the teasing and scoffing of its companions.

In addition to a general treatment most cases demand also a specific one. This consists of exercises in the normal motions of speech. The stuttering child must learn to breathe normally when speaking, to cultivate the voice properly, and to pronounce correctly and without hesitation or spasmodic movements. In severe cases these directions can be carried out successfully only with the aid of a specialist. At the beginning of stuttering, it may at times suffice to speak slowly to the child and ask him to repeat slowly and distinctly.

The term "stammering" includes all faults of enunciation, whether made in the pronunciation of vowels or of consonants. Stammering of vowels is characterized by the substitution of short "a" (as in *can*) for long "a" (as in *ale*), or "e" (as in *pen*) for "u" (as in *fun*), etc. Some children drop initial "h's," saying "ut" and "Anna" instead of "hut" and

"Hannah." These mistakes are made occasionally by children who have foreign nurses.

Lisping of vowels includes what is called nasal speech. This can be produced in various ways: either by a congenital perforation in the palate (see HARELIP AND CLEFT PALATE), or when, following a sickness (for instance, diphtheria), paralysis of the soft palate occurs, or, finally, from relaxation of the organs of speech. It also exists where there are enlarged tonsils which interfere with the movements of the uvula. The treatment depends upon the cause. In cases of congenital or acquired perforations of the palate, the openings are best closed by operation, or the patient may wear an apparatus (*obturator*) which closes the space. Such an obturator is very effective. It consists of an artificial plate with a plug which corresponds to the perforation, and it is attached with clamps to the teeth like artificial teeth-plates. After the operation has been performed and an obturator applied, it is necessary to make certain speech-exercises. If the nasal speech be the result of paralysis of the uvula, massage and electricity will cure the affection. In these cases speech-exercises are likewise necessary.

Lisping of consonants is a very common disturbance of speech. The most frequent form is to substitute "t" and "d" for "k" and hard "g." This error is easily corrected. If one pronounce successively "ta, ta, ta," at the same time pushing the index-finger backward between the tongue and the palate, it will be noticed, when the index-finger has been pushed back up to the second joint, that the sound will change from "ta, ta, ta" to "ka, ka, ka." The same procedure is to be used by persons who say "t" and "d" instead of "k" and "g." They should place the index-finger firmly on the back of the tongue, and utter distinctly "ka," and "ga." Frequent practise will soon give the tongue its proper position, and obviate the mistakes.

Lisping of "s," "z," and other sibilants, is a usual result when the point of the tongue is thrust between the teeth, and instead of producing a clear, loud sound when pronouncing the letter "s," there issues a soft lisping sound like "th." In this case it is necessary to draw the tongue back behind the closed teeth. If the lisper now tries to say "s," the sharp sound is still lacking; this is produced when the current of air strikes the lower row of teeth near the center. The layman can do this easily by placing a tube or a hollow key to the teeth, producing a whistling sound by blowing into it. Another way of lisping is to speak "s" from the corner of the mouth. This habit is more difficult to treat, and can be cured only by following expert medical advice.

Lisping of the letter "r" is not always regarded as faulty speech, since it is common to certain localities. Instead of speaking the tongue "r," the palate "r" is spoken. The tongue "r" is spoken with the point of the

tongue. This is very easily achieved. By repeating the letters "t-d-a" consecutively, endeavoring to go from "t" to "a" as quickly as possible, almost skipping the "d," it will be noticed that the sound of "d" will gradually be supplanted by that of "r," and instead of saying "t-d-a" the sound will be "t-r-a." By frequent repetition the point of the tongue acquires the necessary elasticity to pronounce the "r" in this manner.

Apoplexy of the right side of the body is often associated with loss of speech, or with word-deafness. Loss of speech is indicated if the patient can not speak at all, or very indistinctly, while fully understanding everything that is said to him. Word-deaf persons have not lost the power of speech, but they have lost the understanding of spoken sounds. Such individuals can express their thoughts, although frequently using incorrect terms; but they can not understand what is said to them. They can hear perfectly, and their position may be likened to that of an individual who is suddenly transplanted from his own country to a foreign land, the language of which is totally unfamiliar to him. In many cases both conditions improve; in others the right-sided paralysis and the speech disturbance remain unchanged for years. This disturbance generally results from paralysis of the right side of the body, and it may therefore be concluded that the center of speech-understanding is situated in the left half of the brain, since the nervous pathways of the brain are crossed, those of the left half of the brain supplying the right side of the body, and vice versa. This influence of the left half of the brain upon the faculty of speech is associated with the congenital use of the right hand. Therefore, when left-handed persons suffer from disturbed speech in consequence of an apoplectic stroke, they are paralyzed on the left side, the center of speech of left-handed persons being situated in the right half of the brain.

For loss of speech following apoplexy or other causes, systematic exercises for the left hand ought to be undertaken, so as to prepare the right half of the brain to become the new speech-center. Systematic writing-exercises for the left hand are of the utmost importance. In addition to these, exercises in forming sounds ought to be taught, and as this is rather difficult for the layman it is best to leave it to a specialist.

The word-deaf person, who does not understand what is said to him, must be taught in some other way to understand; in fact, in a way which all use subconsciously at times. When at a theater one can not clearly understand an actor or a singer, one uses an opera-glass, not to bring the sound nearer, but to see the facial expression; for in order to understand speaking one needs the eyes as well as the ears. One is not consciously using the eyes for that purpose, although everybody knows that the understanding is much better when one looks at the speaker. Therefore, the word-deaf person must learn to read what the lips are saying. This will help him considerably and make him more fit socially.

Hearing is the natural way of understanding, and it is deplorable when a person is deprived of this faculty. A moderate degree of deafness may be benefited by the use of an ear-trumpet. In the presence of total deafness, however, such an instrument is useless. Deaf persons must learn to read from the lips, just like mutes who are taught this in their youth. Plates XXI. and XXII. show clearly the position of the lips when uttering various sounds. It is of benefit to the patient to read frequently from the lips of those about him. A patient's surroundings can do much toward bringing about good results; for the more occasion a patient has to practise lip-reading, the sooner he will be able to apply this method of understanding.

If deafness exist at birth, deaf-mutism will be the inevitable consequence. Total dumbness may result also when children grow deaf at a very early age. Children who have become totally dumb from deafness, or who are congenitally deaf and dumb, had better be placed in an institution for deaf-mutes. In good institutions, children not only learn the language thoroughly by aid of the sense of touch, but their eyes become trained to read fluently from the lips. They are as well off as in a public school, being prepared for the ordinary pursuits of life, and deriving the same privileges as other members of the social body. Some discretion should, however, be exercised in their choice of a pursuit. Many callings, such as lithography, printing, clock-making, book-binding, etc., are open to deaf-mutes; and there are many deaf and dumb persons who not only derive a good income from their work, but who show marked efficiency in their professions. If the mental faculties of a deaf and dumb child be of a high order, there are still other pursuits to choose among. Cases are known of deaf-mutes who have studied, and followed callings demanding high education. Of late, attempts have been made to study the effect of hearing-exercises in congenital deafness. In the presence of total deafness such exercises are useless, but where there is some trace of hearing they are of more value, especially for the acquirement of correct speech.

Aphasia is a peculiar form of speech disturbance resulting from disease or injury to the speech mechanism. According to whether it affects the sensory or the motor part of the apparatus of speech, distinction is made between *sensory* aphasia and *motor* aphasia. The former condition gives rise to word-deafness or word-blindness; while motor aphasia renders the affected person unable to give expression to his thoughts. In some forms of aphasia the patient may be able to speak and hear perfectly normally, but be incapable of comprehending spoken sounds. Still another form is characterized by inability to interpret written characters, although the patient's sense of sight is otherwise unaffected. The treatment of aphasia must be directed toward the causative factor, which may be cerebral hemorrhage, brain tumors, or some form of mental disease.

Amnesia, or morbid forgetfulness, may be mentioned in this article, as being a rather frequent cause of halting or stuttering speech. It may be caused by great excitement, by exhaustion following sexual excesses, by severe and prolonged headache, or by febrile diseases. *Verbal amnesia* is a special form, which causes the patient to forget the meaning of words, so that he selects wrong terms in his speech, or fails to understand what is said to him. Amnesia is a frequent accompaniment of old age; and it exists as a transient symptom in many cases of acute drunkenness, and as a more or less permanent condition in habitual drunkards. The cause must be treated in order to remove the symptom.

Apraxia is a very serious, but fortunately rare condition. The individual affected by this disease loses all power of communicating his thoughts, by words as well as by signs, and forgets the use of even the most common objects. He may attempt to get his legs into his coat-sleeves, believing them to be trousers; he may use his tea or coffee for his ablutions; and make other equally radical mistakes.

SPERMATORRHEA.—See SEMINAL LOSSES.

SPICES.—It is a peculiarity of the most important animal foods that they have but little flavor and taste. Since for this reason they exert but an insufficient stimulation upon the body, it is necessary, by the addition of spices to supply what nature has denied them. Spices belong to the great group of food stimulants which are distinguished from the foodstuffs proper. According to this criterion, vinegar and common salt may also be classified as spices, and likewise various artificial preparations, such as meat extract, etc. All these substances are to answer the twofold purpose of promoting the appetite by acting as stimulants upon the organs of smell and taste, and of stimulating the digestive organs to a thorough digestion by the secretion of sufficient digestive juices. Common salt has still another purpose; namely, to preserve the normal amount of salt in the human body, 60 per cent. of which is an 0.8 per cent. solution of common salt. This substance, therefore, is justly considered a true food also; but in cooking it should, nevertheless, be employed only to a moderate degree, as an abundant use of it may have serious disadvantages. Animal foods, as a rule, require a smaller addition of salt than do vegetable foods.

This rule of prudent moderation applies in the same manner to the spices proper. Dishes too well seasoned cause thirst, and are thus apt to lead directly to immoderate drinking; and, furthermore, the stomach becomes weakened by being constantly irritated beyond its capabilities. This is the reason why diseases of the stomach are very common in England where ginger, curry, and spiced sauces are taken with every meal; and it is an open question whether the tendency to the various forms of gout, which are also especially prevalent in England, may not in a certain measure be traced to excessive seasoning. It is probable that this custom was

introduced into England from its tropical colonies which are particularly the home of the pungent spices. It would seem that under the glowing sun of the equator, which relaxes every manifestation of life, the stomach also requires the strongest stimulation. That is why nature with motherly foresight causes pepper, ginger, nutmeg, cardamom, cloves, vanilla, and cinnamon to thrive in those countries, adding, as sub-tropic products, saffron, Spanish pepper and paprika; whereas the temperate zone produces the less pungent spices: fennel, dill, caraway, anise, coriander, mustard, marjoram, and pepper-root.

These natural conditions, however, have nearly been obliterated by centuries of habituation and the growing influences of civilized modes of living, and spices which are indigenous to the tropics have become a necessity also to people living in more rigorous climates. The proper utilization of these condiments constitutes the art of the cook, for not every spice is suitable for every food, but that must be selected which is in keeping with the dish proper. The judicious seasoning of a dish, by its aromatic smell, actually causes one's mouth to water; and, as is well known, saliva is the first important digestive juice which the morsel can not spare in the process of being thoroughly utilized in the organism. If, then, the morsel reaches the stomach well provided with saliva, the stimulation it contains will cause a profuse secretion of the gastric juice which is to perform the principal share of digestion; whereas, if this required stimulation is absent, the digestion will be insufficient, so that a portion of the food leaves the body without being utilized. The important point in nutrition is not so much the food ingested as the quantity of food digested. The competent cook, therefore, adds neither too much seasoning nor too little, but knows exactly the quantity that is needed. Seasoning the food after it is brought to the table is not satisfactory, since the condiments used do not permeate it to the desired degree.

SPIGELIA.—The rhizome and rootlets of the Carolina pink, or *Spigelia Marilandica*. It is said to contain an alkaloid called *spigelin*. One or two teaspoonfuls of the fluid extract are given for roundworms. Like other drugs used for this purpose, it is best to give it on an empty stomach, following it with a brisk purge. An overdose may cause flushing and dryness of the skin, swelling of the face, dimness of vision, and delirium.

SPINAL CORD.—For anatomy and physiology, see **INTRODUCTORY CHAPTERS** (p. 66).

SPINE, CURVATURE OF.—See **VERTEBRAL COLUMN, CURVATURE OF.**

SPLEEN, DISEASES OF.—The spleen is a small organ situated between the stomach and the diaphragm (see p. 58). Affections of this organ are usually secondary to other diseases and are, therefore, of very little importance to the layman. Enlargement of the spleen is frequently an accompanying symptom in malaria and in typhoid fever.

SPOTTED FEVER.—A popular name for cerebrospinal meningitis. See MENINGITIS.

SPRAIN.—An injury caused by wrenching, torsion, or tearing of the ligaments surrounding a joint. The joints of the hand and the foot are most often affected, the former by violent bending of the hand (as by a fall), the latter by twisting the foot when walking (misstep). The injury causes severe pain. The joint swells, and its motility is very much impaired if not altogether suspended. This interference with the movements of the joint is largely due to the great painfulness of the condition. As the swelling increases rapidly, palpation can not always establish whether there is a sprain or a fracture. Until the physician arrives, treatment consists of rest, keeping the injured member in an elevated position, and applications of cold compresses or an ice-bag. The advisability of massage treatment should be decided by the physician.

SPRINGS, MINERAL.—Mineral springs or baths may be divided into the following groups:

(1) *Bitter waters*, the active ingredients of which are sulfate of soda and sulfate of magnesia. These have a laxative effect, and are useful only in constipation, liver troubles, etc. The best known springs supplying these waters are: In *Europe*: Friedrichshall and Mergentheim, Germany; in the *United States*: Saratoga, N. Y., Frenchlick, Ind., and Hot Springs, Va. The bottled waters most commonly used are Apenta and Hunyadi Janos.

(2) *Iron springs*, containing iron oxid in combination with carbonic acid. These waters are usually taken internally, but have been employed also as baths. In the latter use, however, the water acts just like an ordinary bath, for the iron is not absorbed by the skin. Drinking the water is indicated in anemia, chlorosis, and other weakened conditions of the system. The iron in this water does not harm the teeth, and it is therefore unnecessary to drink it through a tube. The poor teeth occurring in such cases are not due to the iron but to the anemia. Among springs of this type may be mentioned: Hot Springs, Va., Berkeley Springs, W. Va., and Saratoga Springs, N. Y. Some springs contain alkaline sulfates of iron, and for this reason are also laxative. Their use is indicated in anemia combined with obstinate constipation. Others contain in addition arsenic, and have a particularly favorable action on tissue metabolism. Clifton Springs, N. Y., is an example.

(3) *Alkaline springs*, which are suitable for internal use only, and have no value over ordinary water when taken as baths. They contain lime in addition to carbonic and sulfuric acids. The warm springs are divided into three groups: (a) warm alkaline springs, for gout, kidney- and bladder-stones, and diabetes; (b) warm salines, for catarrhs of the respiratory organs; and (c) warm alkaline-salines, for diseases of the stomach, liver, and intestines.

(4) *Salt springs*, containing ordinary salt either alone or combined with carbonic acid. They exert a favorable effect upon the stools and urine, and help to dissolve catarrhal mucus. Their activity is increased by the presence of the carbonic acid, but they are apt to cause disturbances of appetite. They are mainly employed in chronic gastric catarrhs, in obstinate constipation, and in obesity. In scrofula the water is also used for bathing. There are several varieties of these springs: (a) ordinary cold salines; (b) cold, carbonated salines; (c) ordinary warm salines; and (d) warm carbonated salines, which have also been largely recommended for diseases of the heart and spinal cord. Many of these salines contain also iodine, and are therefore indicated in glandular affections, joint-diseases, syphilis, and skin-diseases.

(5) *Lithia water*, containing in addition to the sodium bicarbonate a lithia salt which possesses the property of dissolving uric acid, wherefore it is taken for gout, calculi, etc.

(6) *Mud baths*, used as a diaphoretic measure in chronic rheumatism, gout, female complaints, etc. The mud is diluted with sufficient water for bathing purposes. Among the best known resorts are Hot Springs, Ark., Yellowstone National Park, Wyo. and Mont., and numerous California resorts.

(7) *Sulfur springs*, used for bathing purposes only. The water has the odor and taste of decayed eggs, and may readily cause gastric and intestinal disturbances. The water is used in gout, rheumatism, scrofula, syphilis, etc.

(8) *Sea baths*, to be recommended only for healthy children and adults. The proper time is from July to September. These baths are intended as a tonic after convalescence has been established.

(9) *Hot springs*, without any distinguishing mineral constituents. These are used almost entirely for bathing purposes, although there are usually other waters present which may be taken internally. Salts from other springs may be added to the water of thermal springs when taken in connection with a "cure." These baths are indicated in rheumatism, gout, spinal diseases, and female complaints, but are not suited to nervous patients. See also the article on MINERAL WATERS.

SPUTUM.—The material expectorated from the air-passages by the acts of hawking and coughing. In addition to the saliva from the mouth, it usually contains watery, slimy, or purulent matter, which has been excreted from the mucous membrane lining the respiratory passages. The sputum may contain also blood and fibrin, cells from the bronchial mucosa, crystals derived from the tissue fluids, elastic fibers from the lungs, foreign bodies (such as coal-dust, rust, etc.), and minute vegetable and animal organisms. If there is much mucus present in the sputum, the latter becomes tough, stringy, and sticky, and can be expectorated only with difficulty. The more pus it contains, the less tenacious the sputum will be. Dense

masses of sputum, which contain no air, quickly sink in water; but if air be present, it floats on the surface or adheres to the sides of the sputum cup.

The quantity of sputum expectorated varies in different diseases, and even in different stages of the same disease. As a rule the amount increases when inflammatory processes in the air-passages undergo resolution. Dilation of the bronchi, pulmonary cavities, rupture of an encapsulated abscess in the lung, or the perforation of a purulent process from the pleural cavity into one of the bronchi, may all be accompanied by the discharge of large quantities of mucus. The color also varies. If the expectoration consists largely of mucus, it has a whitish color; but if a smaller or larger amount of pus be present, it assumes a yellow or a yellowish-green tinge. Gray or black discoloration points to admixture of dust or soot; while a reddish tinge indicates the presence of blood.

A diagnosis of the prevailing disease can only in exceptional cases be made from an examination of the sputum. The latter must be regarded as merely one of a number of symptoms; and it does not do away with the necessity of making a careful inspection of the lungs. Some forms of sputum, however, are more or less characteristic of the disease present. A slimy, whitish-gray expectoration is indicative of bronchial catarrh; rust-stained sputum is symptomatic of pneumonia; expectoration which, on standing, separates into three layers, is characteristic of pulmonary gangrene; and a purulent sputum which separates into coin-like masses as it sinks to the bottom of the sputum-cup, is indicative of cavities in the lung. A foul odor indicates that a disintegrating process is going on in the lungs. The microscopical examination of the sputum is of great importance. The presence of the tubercle-bacilli establishes a diagnosis of pulmonary tuberculosis; and the increase or decrease in their number affords a fairly good method of estimating whether the disease is improving or getting worse. The small cysts of the echinococci, or their remnants, are rarely found in expectorated matter. For the expectoration or coughing of blood, see HEMOPTYSIS.

SQUILL.—The bulb of *Urginea maritima*, a lily growing in southern Europe. It has a stimulating effect on the heart and kidneys, and is most commonly used to increase the flow of urine. Its pharmacological action resembles that of digitalis. Squill is irritating to the kidneys, and is not used when there is any active local inflammation there, its chief use being indicated in the condition known as dropsy, or a collection of fluid in some cavity of the body. It is sometimes used to stimulate the mucous membrane in bronchitis. An overdose may cause violent abdominal pain, vomiting and purging, urine bloody and lessened or suppressed, collapse, convulsions, and death. The stomach should be emptied and large doses of castor-oil given.

SQUINTING (STRABISMUS).—A faulty position of one or both eyes, rendering it impossible for the patient to focus the visual axes of both eyes simultaneously upon one object. While one eye looks at the object, the other looks past it in another direction (see Plate XII. 6). Squinting may be due to paralysis of an ocular muscle, to rheumatism, or to some other affection. The sudden occurrence of double vision often renders it a very annoying condition. That form of squinting which is most frequent during youth, may be called forth by any of those causes which, either temporarily or permanently, impair vision. These are: (1) obstinate inflammation of the eyes, and the consequences due to this affection (such as spots in the cornea); (2) unequal strength of vision of the eyes; and (3) irregularities of refraction (long-sightedness, near-sightedness, etc.; see **SIGHT, DISTURBANCES OF**). Inward squint may be due to long-sightedness; outward squint, to near-sightedness. Squinting usually begins as an intermittent affection, with periods in which vision is normal; in the course of time, however, it generally becomes permanent. The squinting eye is often weak of vision from birth.

The treatment of squinting is usually attended with success if begun early enough. In many cases, especially the milder ones of youth, the disturbance may be removed by wearing proper glasses (prescribed by a physician) and by systematically exercising the ocular muscles. In the cases of small children who can not yet wear glasses, it is often sufficient to bandage the healthy eye, thereby forcing the squinting eye to look straight at objects. If the condition fails to improve in spite of spectacles and eye-exercises, one should not hesitate to have an operation performed (see next paragraph). This is an absolutely harmless procedure, and accomplishes the desired result in almost every instance. It is, however, advisable to wait until the little patient has acquired a certain amount of reasoning powers; that is, until he is about eight years old. Following the operation, spectacles must be worn in order to prevent a recurrence. Squinting due to diphtheria requires no special treatment; as a rule it improves spontaneously step by step with the increased strength of the child.

The operation for squinting is performed in order to restore the equilibrium between the muscles which move the eye outward and inward. The squint is internal or external according to which muscle is the stronger. In mild cases it is sufficient to separate the stronger muscle from its point of insertion in the eyeball; in severe cases it may be necessary to place the point of insertion of the weaker muscle more anteriorly. The operation is harmless, as the eyeball is not injured. No scar remains. Complete success may not be attained by the first operation, and in such cases a second operation may be necessary. In other cases the effects must be aided by wearing suitable eye-glasses and by exercising the eye-muscles. See also **SIGHT, DISTURBANCES OF**.

ST. VITUS'S DANCE.—In the middle ages the term "St. Vitus's Dance" denoted the peculiar epidemics of dancing which, as a rule, were caused by states of religious exaltation; as, for instance, at the time of the great pestilence in Germany, when whole communities were affected, on account of which the spirit of St. Vitus was invoked. At the present time the term denotes a specific, rather common disease of the nerves, which expresses itself particularly by irregular twitchings of the muscles. The former St.

Vitus's dance was a type of hysteria; at the present time the term applies more particularly to *chorea*.

St. Vitus's dance occurs especially during childhood and at the time of puberty, more often in girls than in boys. Heredity plays no great rôle. The chief cause is articular rheumatism, especially when some valvular disease of the heart is present in addition. St. Vitus's dance may occur also during pregnancy.

In severe cases the muscular twitchings occur over the entire body. The patient tosses about in his bed, with abrupt movements of body and limbs. The brow alternately contracts and relaxes, the



FIG. 393. Steam-bath cabinet.

eyes open and close, the facial twitchings produce the strangest grimaces, speaking and eating become difficult, excursions are made by the arms and legs, and the body twists and turns, assuming the most peculiar positions (muscular delirium). In milder forms there are fewer facial contractions; but rapid twitchings of the fingers, raising and lowering of the toes, etc., are present. Ignorant persons believe children suffering from St. Vitus's dance to be naughty, and punish them accordingly. They are especially punished at school because they are unable to sit quietly, and also because they talk indistinctly, write poorly, and make grimaces. The affection is generally accompanied by a state of irritability, stubbornness, and fickleness; and the condition should, therefore, be judged carefully so as not to do the children an injustice. The twitchings become stronger during any emotional excitement, as well as when the patient feels that he is under observation. They subside during sleep.

With proper treatment, St. Vitus's dance is generally curable; sometimes, however, only after months. Relapses may occur. In severe cases the child should be kept in bed, and pillows and bolsters should be used to guard it

against possible injury from tossing about. The child should, under all conditions, be kept from school; if only for the reason that the twitchings arouse in other children an inclination to imitate them.

STAMMERING.—See SPEECH DISTURBANCES.

STEAM-BATH.—The so-called “Russian bath” is the oldest form of steam-bath known. The attendant merely allowed the steam from a furnace, which served to heat the water for other warm baths, to escape into a large closed room, very little attention being paid to either the pressure or the temperature. Later the method was somewhat improved by maintaining a low pressure of steam, and a definite temperature not above 120° F. The bather remained in this room until a profuse perspiration re-



FIG. 394. Steam-bath for the face.
(A tall pitcher will often be more serviceable than an open vessel)

sulted, some of which, however, consisted of moisture which had condensed on the skin. The bather was also compelled to inhale the steam, this being really superfluous. The steam-bath was followed by a cool sponge-bath or by a plunge. Russian baths are fortunately little used nowadays, being rarely found in modern bathing establishments. A general warning should be given against their use, as they not infrequently bring on hemorrhages into the brain, eye, lungs, etc.

Russian baths have been largely supplanted by so-called cabinet-baths, which may be found in all modern establishments. The cabinet consists of a wooden closet with an aperture for the head, so that this is not exposed to the steam (see Fig. 393). The steam is admitted from below through a system of pipes, and an even pressure of about one-half atmosphere (7.3 pounds per square inch) is maintained. Cloths wrapped around the patient's neck prevent steam from escaping above. Steam-cabinets are made in various shapes, adaptable for full baths, sitz-baths, and baths for different

parts of the body. For a steam-bath for the face and head, an ordinary flat vessel filled with boiling water may be used, the patient inclining his head over it and preventing a too rapid escape of the steam by spreading a piece of oilcloth over his head (see Fig. 394).

Steam-baths are used for the purpose of inducing perspiration. They should last for from ten minutes to half an hour, and should always be followed by a cool douche. In order to increase their action, it may in some cases be advisable to follow them by dry packs, massage, etc. Cabinet-baths are indicated in gout, rheumatism, chronic inflammatory conditions, and in kidney diseases. Persons suffering from diseases of the heart, lungs, spinal cord, or nerves, should not take these baths. See also **HOT-AIR BATH.**

STERILITY.—The inability to conceive. As may be seen in the article on **REPRODUCTION**, in the higher animals the union of male and female elements is necessary in order to have progeny. In the human being the union usually takes place in the womb, and this organ is specially endowed to further the development of the child. The inability to have children depends, then, upon three main factors: a healthy male element (the *spermatozoon*), a healthy female ovum, and a uterus capable of furthering the development of the impregnated ovum. A number of accessory attributes may be of importance during the time of the development of the fetus. Sterility may then result from defects in either sex.

In the male the most important element in bringing about sterility is gonorrhea. This disease is very apt to spread to the seminal vesicles and cause an obliteration of the ducts by which the spermatozoa are conveyed to the spermatic fluid; in rarer instances a disease of the testicles prevents the formation of active spermatozoa. Syphilis is another cause of sterility in men. The reasons for this are not well known, but it is probable that the developed spermatozoa either lack some element in their composition, or are incapable of bringing about a successful impregnation. Other conditions, as lack of testicles, insufficient power of erection, etc., are self-evident causes of sterility. Occasionally anemia, masturbation, neurasthenia, excessive overwork, or chronic poisoning by alcohol, cocain, lead, arsenic, ergot, etc., may be causes of sterility.

In the female many of the same causes are operative in causing sterility. There is little doubt that, of all causes of sterility in woman, gonorrhea plays the most important rôle. The most frequent complications of this disease in woman are inflammation of the tubes (*salpingitis*) and inflammation of the membrane lining the womb (*endometritis*). In the former condition the Fallopian tubes become the site of a chronic inflammation, usually associated with collections of pus. Here, as in gonorrheal epididymitis, the duct for the passage of the seminal elements is obstructed, and the spermatozoa and ova can not be brought together. The ovaries are also

frequently involved in this disease, so that healthy ova are not formed. In gonorrheal endometritis, the inner lining membrane of the womb becomes the seat of a chronic inflammation, making it unsuited for the development of a fetus. Conception may take place, but the impregnated ovum finds an unsuitable soil for its development; and after a longer or shorter time it dies. Syphilis in the female is likewise an important cause of sterility. Conception very frequently takes place if the father or the mother is syphilitic, but miscarriages and still-born children are very common. In this case the element of incomplete development is very apparent. The syphilitic virus seems to act as a slow poison which destroys the vital powers of the cells, either causing their early death, or so diminishing their resistance that other poisons or diseases are not resisted as effectually as under normal conditions.

Among the rarer causes of sterility in women are endometritis due to abortions, lead-poisoning, the abuse of alcohol or opium, absence of the uterus or of the ovaries, and malformation and malposition of the uterus. Anemia is a frequent cause of sterility in women; and grave constitutional diseases, such as tuberculosis, etc., often reduce the ability to conceive. The treatment is naturally dependent upon the causation of the condition, and should be put in the hands of a duly qualified medical practitioner. Only the more important and frequent causes are here discussed. There are many others which a qualified practitioner would appreciate; and in many instances relief may be obtained by proper treatment.

STERILIZATION OF MILK.—See NURSING, NOURISHING OF.

STIFF NECK.—Rigidity of the neck is of frequent occurrence in muscular rheumatism. When, however, the rigidity is due to tonic spasms in the muscles of the back of the neck, so that the head is thrust stiffly backward (straight or laterally), the condition is a sign of inflammation of the cerebral meninges (see MENINGITIS). Tumors in the cerebellum, and traumatic tetanus (lockjaw) also give rise to stiffness of the neck.

STILLINGIA (QUEEN'S ROOT).—The root of the *Stillingia sylvatica*, a perennial plant indigenous to the southern states of North America. It has a bitter, pungent taste, and owes its properties to a volatile oil which it contains, and to an alkaloid called *stillingin*. It is used as an emetic and cathartic. The dose of the fluid extract is from one-half to one teaspoonful.

STOMACH.—For anatomy and physiology, see INTRODUCTORY CHAPTERS (p. 56).

STOMACH, DISEASES OF.—The stomach is liable to a number of acute and chronic affections, which exhibit more or less analogous symptoms.

Under the general term *dyspepsia* is understood only a symptom of stomach disease. The more common general signs of dyspepsia are: discomfort or pain, before or after eating; raising of gas, before or after eating; constipation or diarrhea; loss of appetite, or voracious appetite, etc. Thus

it may be seen by the contrasts here presented, that dyspepsia is not one thing, but many. It is only a sign that the work of some portion of the gastro-intestinal tract is not being performed properly. It may be present in all of the various diseases of the stomach and intestines; or it may be absent even in severe affections. The layman should understand that it is of no value to be told that he has dyspepsia—he knows that; the important question is what causes his dyspepsia. Is it an ulcer or a cancer; is it due to purely nervous causes; or is it a result of faulty diet, or injudicious modes of masticating, etc. These topics are here discussed under their proper headings.

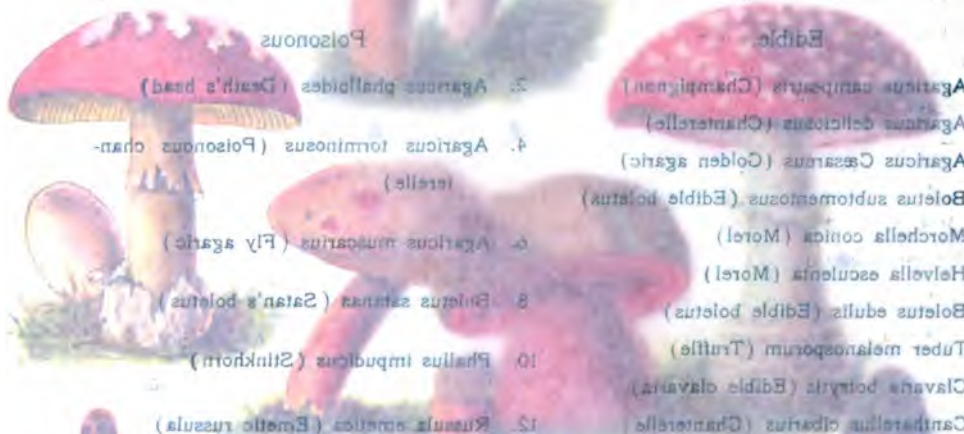
Cancer of the Stomach.—This is a frequent and very malignant disease. It occurs in men as well as in women, mostly between the fortieth and fiftieth years of life. The disease is not, however, limited to this period of life, but may occur both earlier and later, cases being known where it has appeared after the seventieth year. Cancer of the stomach develops so gradually that its onset is usually unnoticed, or not recognized; and when the physician is called it is often too late to effect a cure. The cancerous growth often develops following an old ulcer; and careful treatment of the latter condition is therefore doubly imperative in all cases. A chronic ulceration of the stomach is always a menace because of the possibility of the development of a cancerous process. It is claimed that injuries to the stomach, caused by falls, blows, kicks, etc., may occasionally give rise to cancer. Whether a chronic catarrh of the stomach may develop into cancer is very doubtful. It is possible that a cancerous growth (in the stomach as well as in any other part of the body) may be due to infection by a small parasite belonging to the single-cell animal organisms, the *protozoa*. It is also maintained, and not without reason, that cancer may develop as a result of congenital predisposition.

The onset of cancer is slow and insidious, usually beginning with the symptoms attending an obstinate catarrh of the stomach. When a supposed attack of gastritis proves refractory to all medical treatment, and when emaciation, anemia, and loss of strength become manifest, one is always justified in suspecting the presence of a malignant disease of the stomach. Cancer may sometimes be present for many months without causing material disturbances; in fact, all symptoms may be absent until conspicuous anemia and emaciation gradually become noticeable. In other cases, however, the patients suffer greatly from pains in the stomach (especially after eating), and from vomiting which often contains blood or masses resembling coffee-grounds.

The appetite is often entirely lost, the tongue heavily coated, and the bowels very constipated. Great physical weakness is usually present. A sure sign of cancer is the appearance of a tumor which, from small beginnings, may grow to the size of a man's head. The largest tumors, however,



PLATE XX.—FUNGI



- | | |
|---|-----------|
| 1. <i>Agaricus campestris</i> (Champignon) | Edible |
| 3. <i>Agaricus delicatus</i> (Chanterelle) | Edible |
| 5. <i>Agaricus Caesarus</i> (Golden agaric) | Edible |
| 7. <i>Boletus subtomentosus</i> (Edible boletus) | Edible |
| 9. <i>Morchella conica</i> (Morel) | Edible |
| 11. <i>Helvella esculenta</i> (Morel) | Edible |
| 13. <i>Boletus edulis</i> (Edible boletus) | Edible |
| 14. <i>Tuber melanosporum</i> (Truffle) | Edible |
| 15. <i>Clavaria botrytis</i> (Edible clavaria) | Edible |
| 16. <i>Cantharellus cibarius</i> (Chanterelle) | Edible |
| 2. <i>Amanita phalloides</i> (Death's head) | Poisonous |
| 4. <i>Agaricus tomentosus</i> (Poisonous chanterelle) | Poisonous |
| 6. <i>Agaricus muscarius</i> (Fly agaric) | Poisonous |
| 8. <i>Boletus satanas</i> (Satan's boletus) | Poisonous |
| 10. <i>Phallus impudicus</i> (Stinkhorn) | Poisonous |
| 12. <i>Russula emetica</i> (Emetic russula) | Poisonous |

(For description, see article on Mushrooms)



...the ... is not ... of some ... of ... It may be ... or it may ... should ... and that ... the ...; the ... Is it ... a ...; is it ... or ... are ... Under their ...

PLATE XX. - FUNGI

Edible

Poisonous

- | | |
|--|---|
| 1. <i>Agaricus campestris</i> (Champignon) | 2. <i>Agaricus phalloides</i> (Death's head) |
| 3. <i>Agaricus deliciosus</i> (Chanterelle) | 4. <i>Agaricus torminosus</i> (Poisonous chanterelle) |
| 5. <i>Agaricus Casareus</i> (Golden agaric) | |
| 7. <i>Boletus submentosus</i> (Edible boletus) | |
| 9. <i>Morchella conica</i> (Morel) | 6. <i>Agaricus muscarius</i> (Fly agaric) |
| 11. <i>Helvella esculenta</i> (Morel) | 8. <i>Boletus satanas</i> (Satan's boletus) |
| 13. <i>Boletus edulis</i> (Edible boletus) | 10. <i>Phallus impudicus</i> (Stinkhorn) |
| 14. <i>Tuber melanosporum</i> (Truffle) | 12. <i>Russula emetica</i> (Emetic russula) |
| 15. <i>Clavaria botrytis</i> (Edible clavaria) | |
| 16. <i>Cantharellus cibarius</i> (Chanterelle) | |

(For description, see article on *Mushrooms*)



are not always the most dangerous. Their seat is far more important. Cancer causes the most disagreeable symptoms when situated at the exit of the stomach—at the *pylorus*. The growth always causes a narrowing at this place, so that food can not readily pass into the intestine. It therefore accumulates, decomposes, and is constantly vomited. The larger the tumor grows, the more readily can it be felt through the skin. Medical science is, however, able to detect cancer of the stomach before the tumor is palpable. The physician should always test the digestive power of the stomach, and make a chemical examination of its contents in all cases of suspected gastric disorder.

To attempt the cure of cancer by internal remedies is hopeless. Such attempts only cause the loss of valuable time during which the cancer might easily have been removed by an operation. When the tumor has become very large, the time for surgical interference has probably passed. The earlier the operation is performed, the better are the prospects of a permanent cure.

Catarrh of the Stomach (Gastritis).—According to the duration of the affection, distinction is made between acute and chronic gastritis. An attack of catarrh lasting longer than four to six weeks must be regarded as a chronic case.

Acute gastritis is usually due to dietary indiscretions, rarely to exposure to cold. Even an excessive meal must be considered a dietary error, and may occasionally give rise to catarrh. Overfeeding may be further complicated by the ingestion of substances that are not readily digestible, or by inappropriate mixtures of foods, such as a combination of fatty and sour substances. Sour fermentation is one of the most frequent causes of gastric catarrh. This fermentation results from the action of bacteria which either enter the stomach with the food, or else are already present in the stomach and find a suitable soil for their development in the food introduced. The breaking down of the food leads to the formation of volatile fatty acids (such as lactic acid, butyric acid, acetic acid, etc.) which often may be recognized by their odor. At the same time gases (such as hydrogen, carbon dioxid, sulfureted hydrogen, etc.) may develop. These products of fermentation and putrefaction cause irritation and inflammation of the mucous membrane of the stomach, which soon become manifest by an increased secretion, particularly of mucus. The excessive use of alcoholic beverages is also very liable to produce more or less severe gastric catarrh.

The chief symptoms of acute gastritis are: loss of appetite, stomach-ache varying in intensity and duration, belching of gas, and vomiting. The tongue is usually dry and coated; the region of the stomach is sensitive to pressure, sometimes even slightly swollen; and the bowels are usually constipated. A severe attack may be accompanied by slight fever (see GASTRIC FEVER). The first turbulent symptoms usually disappear in a few

days, and are generally followed by rapid recovery. If, however, the patient fails to exercise proper care, the affection is apt to become protracted, and may persist for several weeks. Involvement of the intestines, which occasionally occurs, is frequently characterized by diarrhea.

The treatment of acute gastritis does not, as a rule, present any difficulties. The main condition to be met is the removal from the digestive tract of the accumulated and decomposed masses of food, by the administration of a purge. The diet should consist of fluids exclusively. It is often necessary to abstain for some time from both eating and drinking, especially

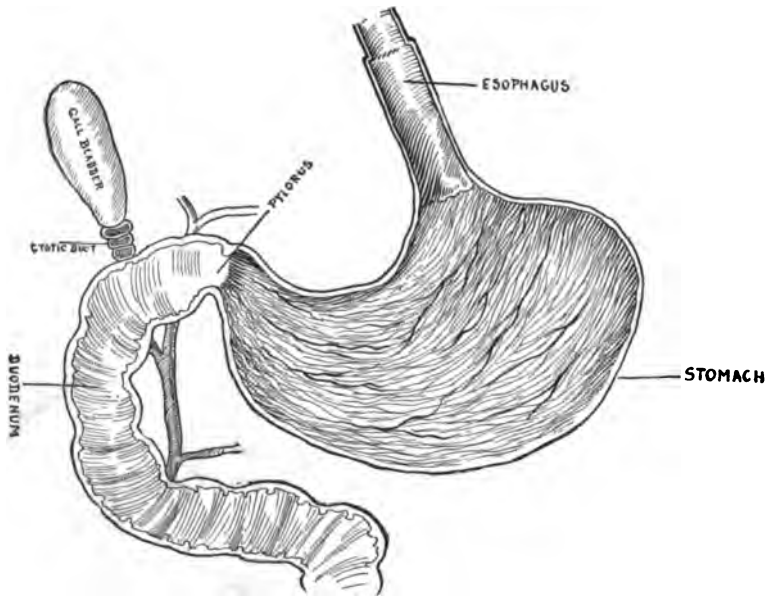


FIG. 395. Diagram showing the stomach in its relation to the esophagus and to the intestine.

when there is a marked inclination to vomit. Beverages must be cool, and should be taken in small quantities. Small pieces of ice may be swallowed in order to overcome the inclination to vomit; and hot poultices to the abdomen will relieve the stomach-ache. When the condition has improved, the patient should go back to his usual fare by very gradual steps.

Chronic gastritis causes more extensive inflammatory processes in the mucous membrane of the stomach, and after persisting for some time these processes may lead to a shrinking, or even to the complete disappearance, of the digestive or mucous glands, thus making the walls of the stomach considerably thinner. In advanced cases the activity of the mucous membrane of the stomach ceases entirely, the gastric juice containing little or no hydrochloric acid. In spite of this deficiency, however, digestion need not necessarily be seriously impaired, because the healthy intestine may act vicariously for the stomach. The mucous membrane of the stomach,

when in a chronic state of inflammatory irritation, secretes large quantities of mucus, and shows a marked tendency to bleed.

The digestive disturbances, as well as the effects on the general health of the patient, may vary greatly. In some cases the disturbances are scarcely noticeable; in others they are very conspicuous. Loss of appetite, constant pressure on the stomach (particularly after eating), belching of gas, vomiting, constipation, and (frequently) emaciation are the chief symptoms. Chronic catarrh of the stomach may persist for years, periods of improvement frequently alternating with aggravations. Occasionally the disease may be arrested for some time.

The treatment of chronic gastritis necessitates constant medical supervision. A strict diet must be conscientiously adhered to. This should consist of easily digestible, semi-liquid foods of high nutritive value. The bowels must be carefully regulated. Various forms of water-treatment may be resorted to, but these, as well as certain internal remedies, must be prescribed by the physician for each individual case.

Dilatation of the Stomach.—By this is meant the relaxation and expansion of the walls of the stomach beyond their normal limits. In healthy individuals the stomach usually sinks to the level of the navel. The lower border of a dilated stomach sinks two or three fingerbreadths below this level; and in severe grades of dilatation it may even extend down to the pelvic bones. Such a stomach may hold two or three times as much as a normal one, its fluid capacity being from three to five quarts. The walls of a dilated stomach are always very distended, relaxed, and thin; and the organ hangs like a heavy sack in the patient's abdomen.

The principal symptom of this morbid condition is loss of elasticity of the walls of the stomach. The muscles are no longer capable of discharging the contents of the stomach into the intestine through the pylorus. This gives rise to the accumulation of food which soon undergoes fermentation and putrefaction, forming gases and acids which are constantly emitted by the patient. It frequently happens that the superfluous contents of the stomach are discharged by vomiting, which may be very profuse and annoying. This is sometimes accompanied by severe pain in the stomach, a sensation of fullness and pressure in the entire abdomen, belchings of sour gases, passing of wind, and persistent constipation, so that the affection is a very disagreeable one.

The development of the dilatation usually takes place slowly, and the affection may exist for many years before reaching its maximum. The severity of the disturbances depend upon the degree of dilatation. Mild degrees are often borne for years without essential impairment of health and nutrition, whereas severe cases cause marked emaciation. Such malignant cases may even lead to death from starvation, because too small an amount of food reaches the intestine, the real seat of nutrition. Dilatation

of the stomach is rarely due to a simple distention and relaxation of its walls. The higher grades almost invariably develop from the formation of scars which narrow the pylorus, such as frequently occur in connection with ulcers of the stomach. The pylorus (see p. 56) becomes so narrow that fluids can pass it only slowly and in small quantities; solid food not at all.

The treatment of dilatation of the stomach is very difficult, and a cure very uncertain, especially in the severer grades. If narrowing of the pylorus be the cause of the affection, surgical interference is necessary. Operation consists in extirpating the narrowed pylorus or, better still, in establishing an artificial passage between the stomach and the intestine by the operation known as *gastro-enterostomy*. The physician will advise the performance of such an operation only in far-advanced cases which have led to great emaciation and loss of strength. In milder cases internal treatment may bring about considerable improvement, although not a complete cure. Such treatment consists, above all, in maintaining a continued and strict diet. The patient should not partake of large meals, but should eat frequently and only a small amount at each meal. Only very nourishing foods, of liquid or pap-like consistency, should be eaten; and dishes that are difficult to digest should be strictly avoided. Mineral waters, coffee, tea, beer, wine, and thin watery soups should not be taken; while milk, cream, chocolate, and cocoa are to be recommended. Butter and minced veal are likewise advisable. The physician should, in every instance, furnish the patient with a detailed bill of fare, which must be changed from time to time.

In most cases it is necessary to remove the undigested food remaining in the stomach, by washing out the organ in the morning or late at night. This daily washing of the stomach is a valuable remedy, frequently protecting the patient from vomiting. Attention must always be paid to regular, abundant, and easy movements of the bowels. Massage of the stomach, electricity, and the application of water usually strengthen the muscular power of the relaxed stomach.

Displacement of the Stomach.—When emaciation has caused relaxation of the tissues of the body, the expansibility of the ligaments of the internal organs usually diminishes also. All tissues (especially the muscular tissue) expand, and lose the ability to contract vigorously. The condition is quite similar to that of slackened rubber bands. Relaxation of the muscular walls of the stomach and intestine causes these organs, which are generally filled, to follow the law of gravity—that is, they are displaced downward (see Fig. 396). For the symptoms and treatment of this condition, see *Dilatation of the Stomach*.

The stomach may be displaced for years without causing any material disturbances. It is always a long-lasting, but never dangerous, condition.

To cure it requires careful regulation of nutrition, and husbanding of the strength of the body. Plenty of rest, and a nourishing and fattening diet are advisable. The diet had best be regulated and supervised by a physician. Massage which tends to strengthen the musculature of the stomach is likewise beneficial. Electricity and water-treatment subserve the same purpose.

Hyperacidity of the Stomach.—The disease designated by this name is characterized by the secretion of an abnormally large quantity of acid in the gastric juice. The affection is either the result of a chronic inflammation of the mucous membrane of the stomach, causing the secretion of an increased quantity of juice from its proliferated glands; or it is due to a nervous disturbance. The latter is the more frequent cause. Owing to an



FIG. 396. Displacement of the stomach.

abnormally strong irritation of the nerves of the stomach, there is an increased secretion of gastric juice. This is poured out into the stomach so that this organ, instead of being occasionally empty, is always overfilled. Furthermore, the contents of the stomach become greatly diluted.

The patients complain especially of sour belchings, heartburn, acid vomiting and stomach-ache. The pain in the stomach is especially severe when the stomach is empty, because in that case the excess of hydrochloric acid in the gastric juice is not utilized for the digestion of food, but flows freely over the internal surface of the stomach, where it acts very much like a corrosive poison.

The treatment of hyperacidity of the stomach consists in careful regulation of the diet, washing of the stomach, the administration of purges and of medicines which will combine with, and neutralize, the acid, etc. The

affection is usually curable in a comparatively short time. In the nervous cases, psychic treatment (*psychotherapeutics*) is a valuable adjunct. The patient should cultivate a healthy philosophy of living, eat small meals frequently, and keep his mind free from all thoughts concerning the stomach or its vagaries.

Nervous Diseases of the Stomach.—The stomach is subject to quite a number of nervous affections, the more important of which will be briefly discussed in the following:

1. **Nervous dyspepsia** is an affection which occurs only in connection with the ingestion of food, about fifteen minutes to an hour after a meal, and irrespective of whether solid or liquid food had been partaken of. Pressure or pain in front of the stomach, nausea, eructation, and vomiting alternate constantly. The symptoms are very changeable. Constipation is usually present. Other symptoms of nervous irritability manifest themselves, freakish in their occurrences and changes.

2. **Nervous hyperacidity** is characterized by an excessive secretion of free hydrochloric acid in the gastric juice, caused by abnormal irritation of the nerves supplying the membrane of the stomach. See *Hyperacidity of the Stomach*.

3. **Nervous eructations and vomiting** are annoying symptoms which may occur without the presence of any specific affection of the stomach. They are quite independent of the ingestion of food, since they may occur even on an empty stomach. The constant belching of air and gases may become extremely troublesome.

The treatment of nervous affections of the stomach presupposes attention to the primary nervous debility. These disorders have greatly increased during the last few decades, apace with the general increase in cases of neurasthenia. The exact regulation of the diet and of the patient's mode of living must be left to the attending physician. The treatment must not be too formal, but should be thoroughly adapted to the individuality of the patient. Physicians treating such patients should be well trained in psychotherapeutics. See Dubois, *The Psychic Treatment of Nervous Disorders*, New York, 1905, ch. xx., p. 249.

Pains in the Stomach.—These are symptoms of various gastric diseases, and in many cases no clue is offered as to the nature of the affection. The pains may be very slight, or they may increase to the most violent spasmodic disturbances; they may pass off rapidly, or they may last through an entire day; they may recur periodically, or they may remain constant. They may occur as a result of the ingestion of food, usually fifteen minutes to an hour after a meal; or they may arise on an empty stomach, disappearing when food is partaken of. A diagnosis of the causative disorder depends upon the manner in which the pains occur, and their treatment must necessarily be governed by the cause.

A remedy which nearly always proves effective in all forms of stomach-ache is the application of hot poultices, which should be renewed as often as possible. Hot-water bags, or bags filled with hot sand are very useful. It should be borne in mind that pains in the stomach are by no means always associated with some gastric disease. Gall-stones, or other internal affections, may give rise to such pains.

Ulcer of the Stomach.—This is one of the most frequent gastric affections, and the early recognition of this disease is of great practical importance with regard to the treatment. The causes of gastric ulcers are only imperfectly known. Occasionally they arise as a result of external injury to the region of the stomach (blows, falls, etc.); but more frequently they are due to internal injuries to the mucous membrane lining the organ. Burns caused by the ingestion of very hot food or beverages may give rise to ulceration. Poor blood conditions are frequent causes; but very often it is beyond the physician's power to determine the actual factor.

Ulcer of the stomach develops most frequently between the fifteenth and the twenty-fifth year of life, and much oftener in women than in men. In women it is not infrequently a complication of chlorosis. The growth is very slow and chronic. The affection is almost invariably preceded by hyperacidity of the gastric juice, a condition which, therefore, always deserves serious consideration. Hyperacidity manifests itself by sour eructations, heartburn, and stomach-ache, especially before meals. Spasms of the stomach are also occasional results of the corrosive action of an excessive amount of hydrochloric acid.

Gastric ulcer usually begins in the form of small punctiform losses of mucous membrane, which gradually increase in size. The size of an ulcer varies between that of a quarter and that of a silver dollar; in some cases they even attain the size of the palm of the hand. The ulcer, particularly if of long duration, occasionally eats through the stomach-wall, and perforates into the abdominal cavity. Owing to the exudation of matter from the stomach, this unfavorable event is usually followed by a purulent and rapidly fatal inflammation of the peritoneum (*peritonitis*). Such perforations, however, are fortunately rare occurrences. In the majority of cases the ulcer heals with a scar; but it frequently happens that this scar does not become sufficiently firm, so that it is liable to reopen when the mucous membrane is anew irritated by the ingestion of food. The greater number of recurrences must be regarded as the consequences of dietary indiscretions.

The onset of gastric ulcer is generally concealed under various indistinct disturbances of digestion, more definite manifestations developing gradually. Stomach-ache is a constant symptom, usually occurring between fifteen minutes and an hour after a meal. At a later stage of the affection, painfulness sets in, even after the ingestion of small quantities of liquids, so that the patient becomes afraid of eating at all. This causes impairment

of nutrition, and consequent emaciation. The gastric pains are often accompanied by spasms, sour eructations, heartburn, and vomiting. The vomitus often contains blood, and such sudden hemorrhages are frequently the first symptoms which point to the presence of an ulcer. If the prevailing symptoms arouse suspicion as to the presence of a gastric ulcer, an examination by a physician should at once be made. This will tend to furnish more exact points of support for the diagnosis, by demonstrating a circumscribed painful area in the region of the stomach. Constipation is generally present in this condition. The symptoms often persist for years, the disturbances being alternately more or less severe. An ulcer which has healed may recur after five to fifteen years. In some cases several ulcers may develop in close proximity to each other.

The treatment of gastric ulcer requires great care, on the part of the physician as well as on that of the patient. When the presence of an ulcer has been recognized with certainty, it is best for the patient to remain quietly on his back for several weeks. In order to give the stomach absolute rest, only liquid nourishment (milk, soups, etc.) should be taken at the beginning. In case of recurrences it is practical to administer food by rectal enemas. It requires at least two weeks for an ulcer to become covered with a thin, superficial membrane. When this has taken place the patient must maintain a strict diet for several weeks; and not until two or three months have elapsed should he return to his usual fare. Hot dry poultices may be advantageously applied for the relief of the stomach-ache. Hot-water bottles are very practical and efficient. The poultices also assist in the healing of the ulcer.

It has recently become customary in medical practise to administer large quantities of bismuth powder before meals, in order to form a protective covering for the ulcer. This procedure is very appropriate. If the patient be not in a position to take a rest, being obliged to attend to his daily work, it becomes very difficult—often impossible—to effect a cure. Since a strict diet can not very well be observed under such conditions, the only treatment that remains at the physician's disposal is internal medication, which is not certain as to success. In case a hemorrhage from the stomach occurs, immediate rest in bed is imperative. An ice-bag should be placed upon the abdomen, and cracked ice administered. Fluid nourishment only should be given, and in small quantities. Other efforts to stop the bleeding must be left to the physician.

Attempts have been made to treat gastric ulcer by operative means, either by removing the ulcerated part of the membrane, or by performing the operation of gastro-enterostomy, whereby an artificial canal is established through which the food may pass into the intestine. In this way the ulcerated surface is to some extent spared the constant irritation caused by the passage of food. The results so far accomplished by surgical treat-

ment are, however, too uncertain to justify its recommendation. The great majority of gastric ulcers may be cured by careful dietary and medicinal treatment.

STOMATITIS.—An acute inflammation of the mucous membrane of the mouth, characterized by a sensation of soreness and burning in the mouth (especially when eating), and by redness, swelling, and loosening of the gums, which bleed at the slightest touch. In the course of one or two days a smeary coating develops, covering serrated ulcers which rest upon a gray and greasy base. A large portion of the gums may thus be transformed into a sticky mass, usually accompanied with a loathsome odor. The saliva, which is secreted in profusion, becomes discolored, malodorous, and often bloody. If the saliva flows backward into the larynx while the patient is asleep, coughing, or even attacks of suffocation, results. The teeth are loosened, and small parts of the lower jaw-bone may even become necrotic. The tongue is heavily coated, and its edges show impressions of the teeth. In rare cases gangrenous disintegration may occur, occasionally endangering life.

Stomatitis is observed either in isolated cases, or in epidemics, the latter occurring principally in poorly ventilated prisons, barracks, asylums, etc. It may be due to a number of causes. Great heat, continued dampness, anemia, diseases of the lungs, diabetes mellitus, scurvy, and scrofula favor its appearance. The affection almost invariably terminates in recovery, gross negligence being probably always the cause of unfavorable cases. Treatment consists in the use of mouth-washes, to be prescribed by the physician. Internal remedies are frequently employed also.

STRABISMUS.—See SQUINTING.

STRAMONIUM.—The leaves of the *Datura Stramonium*, called also Jamestown-weed, or jimson-weed. It contains atropin, hyoscyamin, and scopolamin. For the action of these alkaloids, see the articles under their respective headings. The tincture of stramonium is given in doses of one to three drops.

STRICTURE OF THE URETHRA.—A contracted condition of the urethra. This may be due to various causes, but the most common are injuries of the mucous membrane of the urethra and of the tissues surrounding it, chronic gonorrhea, and, too often, the inappropriate and corrosive injections used in the faulty treatment of gonorrhea. An injury of the urethra is always accompanied with hemorrhages, often with retention of the urine. After the occurrence of such injuries, which are mostly brought about by a fall, by pressure, or by a blow in the region of the perineum, it is imperative at once to consult a physician. Until he arrives, the patient should keep as quiet as possible, and cold should be applied to the injured part. Strictures arising in consequence of gonorrhea appear slowly and insidiously, the stream of urine gradually diminishing in strength and

diameter until it is voided only in drops. Finally its discharge is attended with pain, and can be accomplished only with the aid of abdominal pressure. Changes take place in that part of the urethra which is situated behind the stricture, and affections of the bladder set in. Individuals who have been afflicted with gonorrhea for a considerable time should pay attention to these manifestations in order to avoid the more marked degrees of stricture, which often can be removed only by operation.

Treatment, otherwise than by surgery, is largely mechanical, distention being accomplished gradually by the introduction of sounds of increasing thickness. As this process is sometimes entrusted to the patient himself, it is advisable to state that the sounds which are employed should always be carefully disinfected, that they must be lubricated, and that, to avoid the much-dreaded "wrong passages," force should never be used when pushing the sound through the narrow place. It is best, however, to leave this distention-cure in the hands of the physician; and only exceptionally should the patient, with the permission of the physician and instructed by him, undertake the process for himself. Even after the cure is completed, it is necessary that the physician from time to time make a controlling examination to determine whether the result which was finally obtained, and which is sufficient for normal function, has remained a permanent one. Unfortunate events, such as hemorrhages of the urethra, irritation of the bladder, and suppurations in the tissues surrounding the urethra, always require the attention of a physician, as they may eventually threaten the life of the patient, and must always be looked upon as considerable disturbances to the course of recovery. Entrance of urine into injured tissues may under some circumstances give rise to blood-poisoning.

STROPHANTHUS.—A substance obtained from the seeds of the *Strophanthus hispidus*, a climbing shrub of tropical Africa, from which the natives make arrow-poison. It contains a glycosid, *strophanthin*. The chief action of strophanthus is upon the muscles, a moderate dose acting as a direct stimulant, a large dose as a paralyzant. It acts also as a direct heart stimulant, rendering the cardiac action slower and more forceful. It increases the blood pressure (probably by its combined action on the heart and on the blood-vessels) and also the flow of urine. The action of strophanthus is similar to that of digitalis, but it is quicker than the latter, being felt in about an hour after taking, and lasting four to eight hours. It is also less irritating to the stomach. The dose of the tincture of strophanthus is five to fifteen drops.

STRYCHNIN-POISONING.—Poisoning by strychnin (see *NUX VOMICA*) may result from the accidental use of preparations intended for the extermination of rats or other vermin. The general symptoms consist in muscular twitchings followed by rigidity of the entire body, which becomes hard as a board. The eyes are turned, and the mouth foams. After a short period

of rest another seizure occurs. There are never more than five attacks. Death may ensue ten to twenty minutes after the poison has been swallowed, although occasionally a few hours may elapse.

When strychnin has been swallowed accidentally, an emetic should at once be administered, *before* the spasms set in. If this be not possible, the physician, who should be summoned immediately, will endeavor to check the convulsions by administering chloroform or some other narcotic until the poison has been eliminated from the system.

STUTTERING.—See SPEECH DISTURBANCES.

STY.—An inflammation of the glands situated in the margin of the eyelids. It manifests itself by a rapidly developing, circumscribed swelling of the edge of the lid, which in a few days becomes purulent. In some in-

stances the swelling affects not only the margin, but extends over the entire eyelid. An eye thus affected impresses the uninitiated as being afflicted with a severe disorder, whereas the inflammation is really quite harmless. See Plate XII. 3. Recurrences may be prevented by the continued use of a salve which should be prescribed by a physician.

Internal sty is a swelling of the glands situated in the cartilage of the lid. It develops gradually, without special inflammatory symptoms, and represents a nearly globular, circumscribed swelling which is visible externally (see Plate XII. 5). This may be removed by a slight operation.

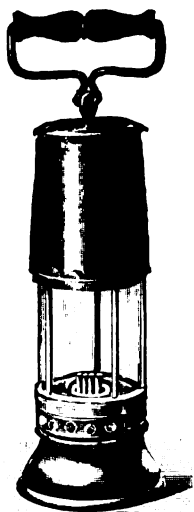


FIG. 397. Davy Lamp.

SUFFOCATION.—A condition of suspended animation, caused either by the inhalation of noxious, irrespirable gases, or by obstruction of the air-passages (as in hanging or drowning). The gases which most frequently give rise to suffocation are

coal-gas and illuminating-gas, both of which contain quantities of carbon dioxid (carbonic acid). The symptoms of suffocation consist of headache and vertigo, ringing in the ears, and loss of motility and sensation. The activity of the heart is retarded; and nausea and vomiting occur occasionally.

A person mildly poisoned should be removed to a place where the air is pure, his head placed in an elevated position, and artificial respiration resorted to. Attempts at resuscitation are supported by pouring cold water over the patient's back, by applying mustard-poultices to the chest and to the calves of the legs, and by the use of strong smelling-salts, such as spirits of sal ammoniac.

Accidents due to the inhalation of fire-damp (choke-damp and sewer-gas) are more frequent. When entering a room which is filled with poisonous gases, the rescuer should proceed with the greatest caution in order that

he may not become suffocated himself. The first thing to be done is to effect a supply of fresh air to the gas-filled room; if necessary, by breaking the window-panes. If the room be on the ground floor, this can easily be done; if not, one should fasten a sponge or a piece of cloth saturated with water or vinegar over mouth and nose, leave the door wide open after enter-

ing the room, and endeavor to reach a window as quickly as possible and break the panes.

The greatest caution is necessary when entering mines, cellars, or sewers. The rescuer should have a cloth saturated with vinegar tied over his mouth and nose, and should be supplied with a Davy lamp (a lamp so protected as to prevent the ignition of gases; see Fig. 397). He should be lowered by means of a rope tied around his shoulders, while a thinner line should be fastened to his wrist so that he may quickly signal to those above when he wishes to be hoisted up. The rescuer should carry with him a reserve rope by means of which to hoist up the victim. The sponge or cloth saturated with vinegar may be advantageously supplanted by a helmet or other contrivance by which the rescuer may be constantly supplied with fresh air. In cases of emergency it is advisable to agitate the air in the shaft by lowering an inverted umbrella at the end of

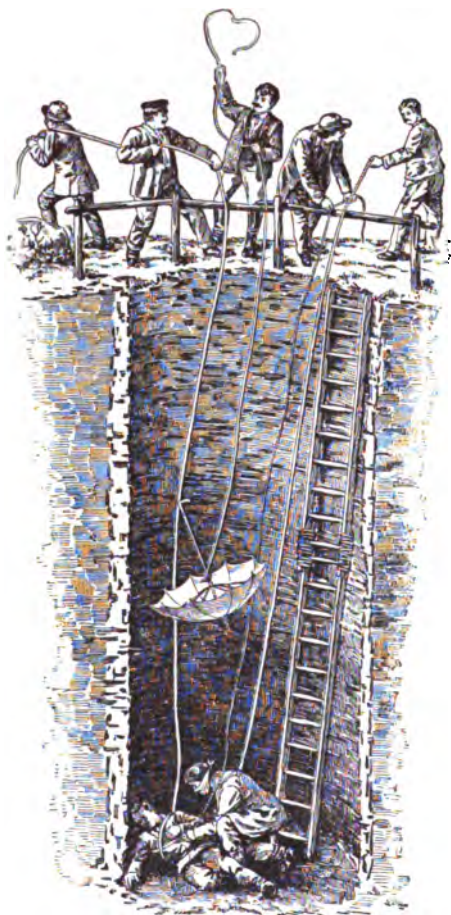


FIG. 398. Rescuing a suffocated person.

a rope, alternately pulling it up and lowering it (see Fig. 398). This also removes part of the poisonous gases. When the poisoned person has been brought to the surface, efforts to resuscitate him must be carried on as described in the foregoing.

SUGAR.—In the study of dietetics there is no article which has been judged with more inconsistency than sugar. It has been alternately regarded as an article of luxury and as one of nourishment; but as a matter of fact its nutritive value has been generally underrated. The fact that women and children are so partial to sugar, principally in the form of candy, is due to the circumstance that their taste perception has not been corrupted

by strong spices or stimulants, such as alcohol and tobacco. The mild sugar contained in milk, the first article of nourishment for mankind, scarcely comes under consideration in later years when the craving for sweets is largely satisfied by cane-sugar, beet-sugar, or honey. Many stomach disorders are caused by overindulgence in sugar and candy. That candies which adhere between the teeth, forming lactic acid, may affect the teeth and destroy them, is as certain as that excessive indulgence in sweets makes the stomach sour and diminishes the appetite.

Pure sugar nevertheless remains an important nutritive factor; and if taken moderately and in proper preparations, it is a valuable source of energy. For long mountain tramps, wearying hunting expeditions, and prolonged marches, no better article of nourishment can be found than sugar; and if dissolved in a sufficient quantity of water, or taken as chocolate, it quickly repairs expended strength and gives the body fresh material for combustion. As an article of food, sugar has a stimulating effect, and promotes the secretion of the digestive juices. Its great importance as an article of nourishment makes it justifiable to allow children a limited quantity of sweets, and any remnants which remain between the teeth are easily removed by careful cleansing (see **TEETH, CARE OF**). This precaution must not be overlooked. Persons who are inclined to obesity should know that sugar is a great producer of fat. The disproportionate development of the abdomen in young Oriental women is chiefly due to their excessive fondness for cakes and candies. It is worth while for our ladies to remember this if they would avoid a similar fate.

SUGAR OF MILK.—A saccharine substance prepared from cows' milk. It is a white powder, much less sweet than ordinary cane-sugar, and is largely used in making milk mixtures for bottle-fed babies, as it is less apt to ferment and cause trouble than cane-sugar. Given in large doses, sugar of milk increases the amount of urine, and is sometimes used for this purpose in dropsy. It is much used as a basis for various medicinal powders.

SUGGESTION.—This is a phenomenon of mental life which is very difficult of definition, and one which probably for a long time, if not always, will defy analysis. It has been defined as the coming into the mind from without of an idea, a presentation, or any sort of intimation having a meaning for consciousness, which effects lodgment and takes the place it would have if internally aroused within the mind itself by associative processes. This broad definition, as given by Baldwin, makes suggestion a process started by influences from without; and it is quite conceivable that it has many different phenomena. Thus there are (*a*) the suggestions in the sensory-motor sphere due to suggested sensations, such as, for instance, the peculiar quiver which goes up the spinal cord when one sees an accident take place; (*b*) ideo-motor suggestions, which may be quite similar, and result in a like quiver when the idea of the accident comes up, either by

passing the place where it occurred or by other external suggestions; (c) motor suggestions, which may be induced by the sight of emotion, and which are very frequent in the mimics of children, who run, make faces, and do other motor acts in imitation of others; (d) pure sensory suggestions, whereby a sensory idea is made to convey the sense-perception, such as the transfer of a red light to a green one, or shadow into substance; (e) suggestion of personalities, often seen in the influence that one person may have over another, purely by domineering or masterful personal relations.

One can define all the different kinds of suggestibility on a purely phenomenal basis. It seems not impossible that all impressions that come into the mind set up at least two sets of opposing forces. This is seen in many ways, as, for instance, in muscular movements where agonists and antagonists are in constant play. Stimulative and depressive mechanisms are found in all the organs of the body, intestines, blood-vessels, sphincters, etc.; and in the play of ideas there always appear opposites: love and hate, sympathy and aversion, etc. Those in the mental sphere are probably the result of a definite, existing mechanism. These are particularly noticeable in children, where it is not unusual to observe, for instance, a child hang back when offered a piece of candy; and every one knows how frequent is the inclination to bite on a sore tooth, notwithstanding the pain produced. In this way we get two suggestible forces: a positive suggestibility which induces one to do something, and a negative suggestibility which would check or restrict that doing.

In physiological conditions the contrary idea is constantly coming into play, and moreover has its very important self-preservative qualities. If one should immediately react to every suggestion, one can see how serious might be the consequences, and therefore the important self-preservative action that contrary or negative suggestions may have in human development. They prevent the mind, as it were, from being taken by surprise; and by starting a wave of opposition they directly permit time to elapse so that the judgment may act. In some diseased conditions it is not at all improbable that the negative suggestions which are a product of the stimulation of the primary suggestions come to be exaggerated in activity, and thus we have a distinct negativism which may predominate the diseased condition. This is particularly true in the disease known as *dementia præcox*, and is not infrequent in hysteria, constituting at times one of the most important features of the disease, although hysteria is above all that disease in which the immediate effect of the primary suggestion is carried out without the helpful physiological antagonism of the contrary suggestion. Suggestibility is probably largely brought about by the affective life, or what has been termed the emotional life; and emotional stimuli are the most potent sources of suggestive reactions. In modern thought suggestion has often been limited to the series of reactions resulting from the stimulus of

other persons, and the vast field of induced suggestions by hypnosis or by other external processes is now made the subject of very active investigation. It is essential, however, to bear in mind that suggestibility is a very natural process, and that every one possesses it in a greater or less degree. It is represented in its extremes, on the one hand by the profound hysteric who is excessively sensitive to all forms of suggestibility, both external and internal, and on the other hand by the negative dement who resists all influences of whatever kind. For a fuller discussion of this subject, see Dubois, *The Psychic Treatment of Nervous Disorders*, New York, 1905.

SUICIDE.—The voluntary taking of one's own life. Self-destruction and mental derangement are associated much more frequently than the lay mind supposes, it having been proved that the majority of persons who commit suicide are either insane or, at least, mentally abnormal. Statistics furnished by Professor Heller of Kiel, and based upon 300 autopsies made on the bodies of suicides, show conclusively that 43 per cent. were positively, and an additional 18 per cent. probably, in an irresponsible condition at the time of the deed. In cases of self-murder, when no other cause is known, it is therefore of importance that the mental condition of the suicide be investigated. The material results of the act, such as the non-payment of life insurance or the refusal of religious burial, make this precaution a duty.

SULFONAL.—A crystalline compound occurring in colorless prisms which are soluble in 360 parts of cold water and in 15 parts of boiling water. Its difficulty of solution makes its action slow in appearing. The immediate effect of sulfonal is to put the patient to sleep, with slight depression of the cardiac activity and respiration. If the drug is given for any length of time, it may cause very disagreeable symptoms, which may end in death. This chronic poisoning first shows itself in increasing weakness and languor, staggering gait, and perhaps nausea, vomiting, and diarrhea. The urine becomes a dark red in color. These symptoms are soon followed by violent abdominal pain, marked constipation, vomiting, spasms of the abdominal muscles, unconsciousness, and death. Sulfonal is, therefore, a drug which should not be used indiscriminately. Ten to twenty grains is the usual dose. It is often given in hot milk.

SULFUR.—A yellowish or whitish, non-metallic, crystalline powder. It is insoluble in water, but is soluble in alkaline solutions, alcohol, ether, etc. Taken internally it acts as a gentle laxative. One or two teaspoonfuls with sirup or molasses are used for this purpose. Externally, sulfur is used in an ointment for various skin-diseases. Used in this way it is the most reliable remedy for the cure of the itch.

SULFUR-BATH, ARTIFICIAL.—This bath is prepared by adding two or three dessert-spoonfuls of potassium sulfid to an ordinary bath of a temperature of 95° F. It should preferably be taken in a wooden tub; never in one made of metal. Owing to the development of sulfureted hydrogen,

the bath has a disagreeable odor, wherefore it should not be taken at home. This bath, which at times is very irritating to the skin, is used in syphilis and in skin-diseases. A warm cleansing bath should be taken after the sulfur-bath. Inhalation of the sulfureted hydrogen may lead to severe toxic symptoms, such as headache, nausea, and vomiting.

SULFURIC ACID.—A colorless, very corrosive mineral acid. It destroys any organic substance with which it comes in contact, giving it a black, charred appearance. If the strong acid be taken internally, it corrodes the gullet and stomach, causing a very violent inflammation; and it may kill very quickly. The antidote is any alkali, such as magnesia, chalk, whitewash, or soap. The strong acid is used externally as a caustic to remove warts, etc. Internally, the diluted acid is given in certain forms of diarrhea, for the night-sweat of consumption, and as a preventive and antidote for lead-poisoning. Aromatic sulfuric acid is most commonly used. The dose of this is five to twenty drops.

SUMMER DIARRHEA.—See **CHOLERA INFANTUM**.

SUN-BATH.—Exposure of the naked body to the sun's rays. For this purpose modern sanitariums are provided with special arrangements to keep the bathers from the view of outsiders. Similar provisions may be made on the roof of one's dwelling, or on an appropriate balcony. Some persons take their sun-baths while walking through the woods, selecting lonely, sunny places where they feel secure from the view of intruders. It is best, however, to take these baths in special institutions. The nude patient should lie on a mattress covered with a washable oilcloth, or on a board. The head is to be protected from the sun, so that only the trunk and limbs are exposed. The patient remains for some time in this posture. If his skin is sensitive, and if it is desirable that he be made to perspire, he is wrapped in white covers and exposed to the sun. This should be followed by a cool shower-bath. The skin tans quickly. Often a rash, caused by the sun, appears on the skin, a sign that the sun-bath has lasted too long. This rash must be prevented, as it interferes with the cure. The supposition that the sun draws the morbid matter from the body by means of this rash, is nonsense; and it is equally nonsensical to regard it as a desirable "crisis." Sun-baths are commendable for anemia, nervousness, lung troubles, gout and rheumatism.

SUNSTROKE.—A cerebral disturbance caused by exposure to the scorching rays of the sun. It is not a disease due to overexertion in sultry weather, as is **HEAT-STROKE**; but it is the result of the direct effect of the burning sunbeams on the unprotected skin, especially on that of the head. The skin may even get slightly burned, becoming red and painful. Persons who drink alcoholic beverages to excess are much more liable to meet with this accident than are non-drinkers.

Sunstroke is a sudden acute inflammation of the cerebral meninges, and

is characterized by the same symptoms attending heat-stroke; namely, dizziness, convulsions, and fever. The patient should be carried to a shady place, his clothes loosened, and a cold compress applied to his head. Cold water should be administered. In order to avoid sunstroke, one should never uncover the head in strong sunlight, nor lie down in sunny places without protecting the head. It is well known that the Bedouins, a nomadic Arabian tribe, always wear a neck-cloth as a protection against the scorching sun-rays.

SUPPOSITORY.—A cone-shaped mass of cocoa-butter, containing some medicine, and which is introduced into the rectum to be absorbed by the mucous membrane. This is an excellent method of administering medicine, especially when it can not readily be taken by mouth on account of a disagreeable taste, or when it is desirable to have it act rapidly, as in intestinal or abdominal disorders. Suppositories are used also for introduction into the vagina or urethra. If wrapped in tin-foil, this must be removed before inserting the suppository.

SUPRARENAL BODIES, INFLAMMATION OF.—See ADDISON'S DISEASE.

SUPRARENAL GLAND.—A small gland situated just above the kidney. It secretes a substance which has a remarkable effect on the blood-vessels, contracting their walls and narrowing their lumina. Various extracts of the gland possess this property, because of the presence of a substance called *epinephrin*, and are largely utilized in medicine. Placed on a mucous membrane, or on an abraded surface, this substance causes the vessels to contract to such an extent that the tissues grow pale. It is therefore used locally to control an oozing hemorrhage, or to deplete a congested area. When injected into the body it causes contraction of the arteries through its direct action on the walls of the vessels, thus raising the blood-pressure. It is used for this purpose in surgical shock. Solutions of the desiccated gland are active even though highly diluted. The most common preparation is *adrenalin chlorid*, which comes in a strength of 1:1000.

SWEAT-BATHS.—See PACKS.

SWEDISH GYMNASTICS.—See GYMNASTICS.

SWEET SPIRIT OF NITER (SPIRITUS ÆTHERIS NITROSI).—A solution of ethyl nitrite in alcohol. It is a volatile, inflammable liquid, of a yellowish color, and with the odor and burning taste of ether. It is used as an antispasmodic, and for the purposes of increasing the excretions of sweat and urine. It stimulates the stomach, and is highly efficacious in relieving nausea. The dose is from thirty drops to a teaspoonful, occasionally more.

SWIMMING.—This is an excellent form of exercise, and has a beneficial effect upon various physiological processes. It increases the bodily strength and agility, regulates circulation, promotes metabolism, and

cleanses the body. In spite of its great hygienic value, however, certain precautions must be observed when swimming. This is particularly necessary when instructing children. Some persons turn blue after a brief exposure to the water, complain of palpitation of the heart and of difficulty in breathing, and can not get warm for several hours after dressing. If swimming be continued under such circumstances, the bather becomes weak and anemic within a few weeks; whereas he will soon recover if he stops swimming for some time.

Delicate children should not be allowed to indulge in too much bathing and swimming, especially during cool summers. The first bath should be of very short duration in order to avoid unnecessary expenditure of strength.

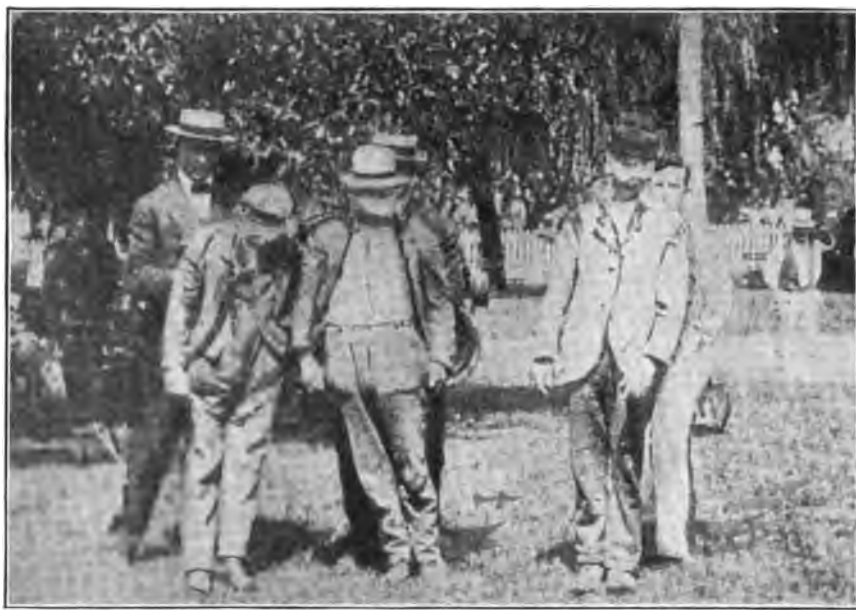


FIG. 399. Photograph showing characteristic swaying in locomotor ataxia. (Romberg symptom.)

Instruction in swimming should preferably be begun when the weather is moderately warm, and the child should be carefully watched to see how the novel exercise affects it. If the swimmer reacts well after the bath, and does not complain of palpitation nor of excessive fatigue, the instruction may be continued with safety. Great appetite after a bath is a sure sign that it has been beneficial. Adults who have kidney troubles, or who have recently recovered from appendicitis, should refrain from swimming.

SYPHILIS.—See **VENEREAL DISEASE.**

T

TABES DORSALIS.—A disease of the spinal cord, giving rise to *locomotor ataxia*. It usually occurs in middle-aged individuals, and more frequently in men than in women. The name "tabes" (wasting away) refers to the protracted course of the disease, which leads to marked emaciation, and confines the patient to his bed for a long period. The disease has no connection whatever with tuberculosis of the lungs.

In the majority of cases, syphilitic infection (from which the patient may have recovered many years previously) is of great importance as a



FIG. 400. Hitting-exercises to improve control of muscles.

cause of dorsal tabes. In some cases the affection is ascribed to colds, drenching, or bodily overexertion. Locomotor ataxia is never the result of masturbation, as is often believed and feared. Nor does it appear that syphilis alone can cause it, although this disease often seems to prepare the soil for other causative factors.

The onset of **tabes dorsalis** takes place insidiously, the first symptom being violent pains in the legs. These pains, which are usually regarded as being due to rheumatism or to some form of neuralgia, may be present a year or more before the appearance of any additional symptoms. Some of the more prominent of these later signs are a sensation as of a constricting band being tied around the body, difficulties in voiding the urine, and

(in men) sexual impotence. Many other symptoms gradually appear during the development of the disease. Among these may be mentioned attacks of pain in the abdomen and in the larynx, disturbances of vision, paralyses of various muscles, swelling of joints (especially of the knee-joints), and ulcers on the feet.

The most striking symptom of tabes dorsalis is the condition known as *locomotor ataxia*, which is characterized by lack of coordination of the muscles governing locomotion. It is not that the muscles themselves are

in any way weakened; but they cease to act in harmony; and this, together with a diminution in sensibility, makes the act of walking a conscious process instead of a mechanical one. The patient is obliged to let his vision aid him in maintaining his equilibrium; and when he takes his eyes off his feet he immediately begins to stagger. The accompanying cut (Fig. 399) shows the characteristic attitude assumed by blindfolded patients suffering from locomotor ataxia. The gait of these patients is peculiar. They lift their feet excessively high from the ground, spread their legs, and take short and rapid strides. The heel usually reaches the ground before the sole of the foot, and the entire manner of walking is indicative of distress. In some cases the arms and hands also become affected, and the patient is rendered unable to use his hands with precision.



FIG. 401. Walking-exercises for locomotor ataxia patients.

He can not dress himself, and spills his food when eating, although the muscular power of the hand is not decreased. In many cases the symptoms gradually increase in severity until the patient is helplessly bed-ridden. There are, however, possibilities for improvement or arrest of the affection.

The treatment includes various hydrotherapeutic, electric, and dietary measures. In former times, when the nature of tabes was unknown, nothing was done to combat the disease; but nowadays expert medical assistance is able to accomplish much for these patients. Even in severe cases, where

it is not possible to arrest the disease, the physician may do much to alleviate the distress. Patients suffering from tabes dorsalis should avoid all "cures" that tend to decrease their physical strength, such as steam-baths, and hot-air baths. All so-called "sweat cures" are detrimental. Mild applications of water and electricity, and nourishing and readily digestible food, are advisable. The patients are often benefited by massage, and by gymnastic exercises consisting of carefully selected coordinated movements. Fig. 400 shows such hitting-exercises for the hands, while Fig. 401 illustrates how such patients may be reeducated in walking.

Under any and all circumstances, patients suffering from locomotor ataxia should beware of quacks. By holding out fraudulent promises of



FIG. 402. Talipes calcaneus.

cure, these gentry rob the patients, thus in many cases compelling them to end their days in public institutions. If, on the other hand, such patients have been advised wisely, they may be able to husband their resources, take up occupations that are not harmful, and lead comparatively comfortable lives of semi-invalidism.

TALIPES CALCANEUS.—A form of clubfoot in which the anterior portion of the foot is drawn up toward the leg, so that only the heel touches the ground (see Fig. 402). This affection is either congenital or acquired. In the latter case it is usually due to muscular paralysis in the calf of the leg, the anterior extensor muscles drawing the foot upward. Congenital talipes can be readily cured by the application of suitable splints or plaster of Paris bandages. When the deformity is due to paralysis, splints may likewise be employed, or the condition may be cured by an operation. Splints, however, do not effect a cure; for the foot assumes its former position

when they are removed. An operation by which the extensor tendons of the paralyzed muscles are transplanted, often gives very gratifying results.

TAMARIND.—The fruit of a tropical tree, the *Tamarindus Indicus*. The pulp contains sugar, tartrates, citrates, and other cathartic salts, and is used as a mild laxative. It has a peculiar bitter-sweet taste and is seldom used alone, being usually combined with other laxative drugs. It is one of the constituents of confection of senna.

TANNIC ACID.—A substance obtained from oak-gall. It is a yellowish or white powder, having a bitter taste, and producing a sensation of constriction, dryness, and roughness in the mouth. Practically all the vegetable astringents depend for their action upon the presence of this acid or some of its derivatives. When tannic acid comes in contact with any albumen, it forms an insoluble compound. Thus, when it is applied to a mucous membrane, it combines to some extent with the albumen in the cells, so that they shrink and become hardened, and their secretion diminished. Tannic acid combines readily with the albumen of the blood, forming a clot, and is therefore used locally to arrest an oozing hemorrhage. It has been given also internally for hemorrhage of the stomach or bowels; but it is of less service here, particularly in intestinal hemorrhage. It is sometimes applied to bleeding piles, either in an ointment or in a suppository. The constricting action of tannic acid is utilized in some forms of diarrhea, being given by the mouth or used in enemas. It is used also in relaxed conditions of the nose, throat, and vagina. Tannic acid is an antidote for poisoning by any alkaloid. It may be given internally in ten grain doses.

TANSY.—The leaves and tops of *Tanacetum vulgare*, the common tansy. Its active principle is a volatile oil, *oleum tanacetii*. It has a stimulating effect on the uterus, and is sometimes taken to produce an abortion, but it is uncertain and dangerous. Tansy-oil may cause violent abdominal pain, vomiting, unconsciousness, convulsions, and death. The legitimate uses of tansy are as a uterine tonic and for intestinal parasites. The infusion is commonly used in doses of one or two tablespoonfuls.

TAPEWORM.—A cestoid worm parasitic on man. Among the numerous varieties of tapeworms, the following are the more important: (1) The tapeworm of the ox, *Tania mediocanellata*; (2) that of the hog, *Tania solium*; and (3) that of fish, *Bothriocephalus latus*. These three forms have about the same life history. They inhabit the small intestine of man, and throw off, from time to time, sexually complete segments which are passed with the stools. The finding of these segments, or the recognition of the eggs by a microscopical examination of the feces, is necessary to establish a diagnosis.

The propagation of tapeworms takes place in a peculiar way, the eggs being developed in a so-called "intermediate host," and each species requiring a certain animal for its proper development. In the case of the

three forms of tapeworm here discussed, man is the "host proper," while the "intermediate hosts" are the ox, the hog, and certain fish (particularly the pike and the salmon). The segments containing the ripe eggs, or ova, are passed from the intestinal canal of man with the feces, and then reach



FIG. 403. Head of the tapeworm of the ox.



FIGS. 404, 405. Ripe segment of the ox-tapeworm. *a*, enlarged; *b*, natural size.

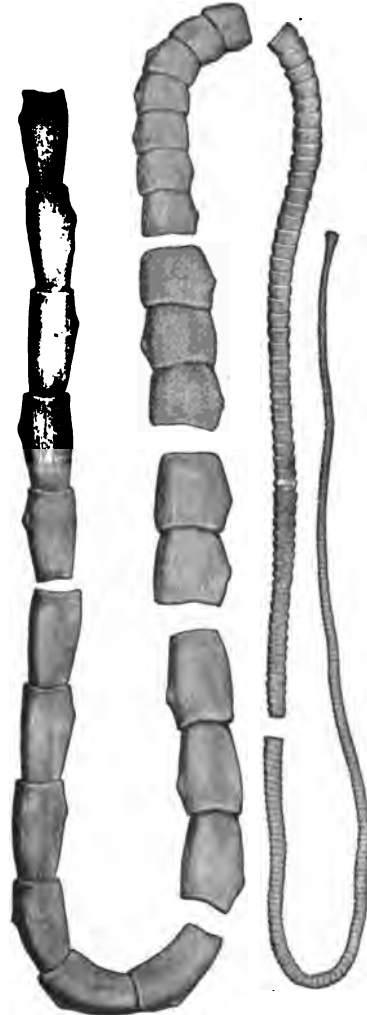


FIG. 406. Parts of the ox-tapeworm (natural size).

the "intermediate host" by coming in contact with the fodder or drink of the respective animals. In the body of the animal the eggs are developed into embryos, which burrow through the intestinal wall and lodge in various organs or tissues, preferably in the muscles, where they form small cysts. In eating the raw or insufficiently cooked meat from any one of these animals, man again becomes infected with the parasite. The small cysts find their

way into the human stomach, where the outer capsule is dissolved, and the head enclosed in each cyst proceeds to develop a supply of egg-containing segments. Thus the circle is completed.

The accompanying illustrations (Figs. 403-410) show the head and a ripe segment of each of these varieties of tapeworm. The head of the tapeworm of the ox (Fig. 403) is somewhat larger than the head of a pin, possesses four suckorial disks, and is often black in color. The segments are broad, quite thick, and translucent; and their length exceeds their breadth. This worm may attain a length of from 12 to 24 feet, and possess between 1,200 and 1,300 segments (Fig. 406).

The head of the tapeworm of the hog (Fig. 407) is about as large as a pin-head; and in addition to the four suckorial disks it is supplied with a circle of hooks. The segments are thinner and more transparent than



FIG. 407. Head of the hog-tapeworm.

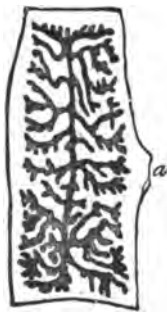


FIG. 408. Ripe segment of the hog-tapeworm. *a*, enlarged; *b*, natural size.



FIG. 409. Head of the fish-tapeworm. *a*, side view, enlarged; *b*, natural size.



FIG. 410. Ripe segment of the fish-tapeworm.

those of the ox-tapeworm, but like the latter they are longer than they are broad. This worm may attain a length of from 6 to 9 feet.

The fish-tapeworm has two suckorial grooves, one on each side of the head. The segments are broader than they are long, and for this reason it is called also the "broad tapeworm." It reaches a length of from 15 to 27 feet, and may contain over 4,000 segments, making it the largest of all the tapeworms infecting man.

The symptoms caused by the presence of a tapeworm in the intestinal canal are usually very slight. It is often accidentally discovered by a casual examination of the stools. Sometimes it may bring about indefinite digestive disturbances, marked either by loss of appetite or by a very much increased appetite, by diarrhea, and by cutting abdominal pains. In children, however, it is apt to cause more marked symptoms, such as salivation, palpitation, vomiting, and even convulsions. The most dangerous tapeworm is that of the fish, which may bring about an extreme condition of anemia. As a rule many more symptoms are ascribed to tapeworms than are really caused by them; and many persons, especially those of a nervous

disposition, are very apt to attribute all their troubles to this intestinal parasite. That this is a false conclusion is proved by the fact that their symptoms continue even after the tapeworm is expelled. Sometimes an abnormal dread of this parasite becomes established in an individual, so that any number of symptoms are believed to be due to its supposed presence, although no trace of the organism can ever be discovered. Such patients are constantly on the lookout for segments in their stools, and are often misled by finding undigested meat remnants which very closely resemble the objects sought for.

If the presence of a tapeworm is suspected, it is easy enough to verify this by taking a mild cathartic, say one or two tablespoonfuls of castor-oil, which, if the suspicion was founded, will cause segments to be passed with the stools. The segments may then be separated from the fecal matter, placed in water or alcohol, and taken to the physician for further examination. When the suspicion has been verified, treatment may be begun, but this should be undertaken only by the physician, as the remedies which it is necessary to employ are by no means safe; and before these are administered, the patient's heart, liver, and kidneys must be thoroughly examined. Especial care is required in the case of young children and old people. In persons suffering from anemia, great physical weakness, consumption, or gastric or intestinal diseases, it is best either to postpone treatment or to give it up entirely. The same rule should be followed in pregnant women.

Although the injury caused by tapeworms may not, in itself, be of great importance, it is nevertheless advisable to expel them on account of the dangers associated with their presence in such diseases as typhoid, intestinal catarrh, or ulcer of the stomach. The hog-tapeworm, moreover, is an element of danger when the eggs or the ripe segments find their way into the stomach of an otherwise healthy person. In these rare cases, the cysts may develop in the various organs, such as the eye, brain, skin, etc., and lead to troublesome chronic disturbances.

Before actual treatment is begun, certain preliminary measures must be attended to. On the afternoon of the day preceding the commencement of the treatment, the patient should take a cathartic. This may be either a bitter saline water, a dose of castor-oil, or some other drug. Following this, the patient should eat as little as possible during the next twenty-four hours, so that only a minimum of fecal matter will enter the intestine. The day of actual treatment, during which the patient remains in bed, a cup of black, sweetened coffee is taken early in the morning, and about half an hour later the prescribed remedy is administered. After one or two hours this is followed by a cathartic. If nausea ensues, ice, black coffee, or lemonade may be given. There are various drugs capable of expelling the tapeworm (vermifuges), among them being extract of male-fern, pomegranate root, kamala, etc. The choice of the remedy must be left to the physician. When

the remedy begins to make itself felt, the patient should go to a chamber or pail filled with warm water, and allow the stool to be passed into this. With the aid of two small rods, a search should be made for the head of the animal. It should always be sought for at the thin end, at the so-called neck, in which the division into segments can scarcely be noticed with the unaided eye. The end of this neck passes into a knob as large as a pin-head, which represents the head of the tapeworm, and which may be most readily distinguished by making the search on a black background. The finding of the head denotes that the remedy has been successful. On the following day a light diet should be given, consisting of tea, cocoa, milk, bread, butter, lean meat, soup, rice, or farina.

If the head has not been passed, a certain period (usually about 8 to 10 weeks) will elapse before new segments are thrown off. It should not be forgotten, however, that the head may have been passed, although the search for it has been unsuccessful.

In order to prevent infection with this parasite, the consumption of raw or half-cooked pork or beef should be avoided. A warning note should be sounded in reference to the so-called "tapeworm specialists," whose efforts to instil fear of the dangers of this affliction, and to magnify the symptoms caused by the presence of the parasite, are merely intended as a means of increasing their clientele. Their statements are always greatly exaggerated.

The tapeworm of the dog (*Tænia echinococcus*) differs from the three forms discussed in the foregoing, in that man is the "intermediate host" in which the ova are developed, while the mature parasite inhabits the body of the dog. See *Echinococcus of the Liver*, s. v. LIVER, DISEASES OF.

TAR.—A semi-liquid, black substance, usually obtained from the destructive distillation of pine-wood, largely from the *Pinus palustris* of the southern United States. It has a peculiar odor and taste, and contains creosote, oils, various hydrocarbons, and pyroligneous acid. Its action much resembles that of creosote, but is milder. It is often used externally as a stimulating application in various skin-diseases. Internally, it is sometimes used as an intestinal disinfectant, and for bronchitis. In England, tar-water was once consumed in large quantities as a preventive and cure for all troubles, as it had the recommendation of a well-known bishop.

TARTAR EMETIC.—See ANTIMONY.

TARTARIC ACID.—A colorless, crystalline, readily soluble compound. It is a local irritant, and may cause fatal irritation of the stomach and intestines if taken in too large doses. The antidote is lime-water, magnesia, or any alkali. In medicine, tartaric acid is used with alkalis to form effervescent drafts, such as Seidlitz powder. Commercially, it is largely used in the manufacture of lemonade, as it is less expensive than citric acid.

TATTOOING.—The practise of decorating the skin by pricking it with needles and introducing pigments into the wounds thus made. Various

colors are used, and the designs executed are often very artistic. The wounds soon heal, and the pigments remain indelibly lodged in the cutaneous tissues. Soldiers and sailors the world over are very fond of thus ornamenting their arms, chest, and back; but it is among the Japanese that tattooing has developed into real art. The process is rather painful; and



FIG. 411. Japanese designs of tattooing.

when a large area of skin is tattooed at one time, it may give rise to considerable inflammation. There is also a danger that the tattooed person may be infected with some contagious disease from which the operator may happen to suffer, especially if the latter, as is often the case, wets the needles with spit before applying the pigments. Fig. 411 shows some very artistic Japanese designs of tattooing.

TEA.—A beverage prepared from the dried leaves of the tea-plant (*Camellia theifera* or *Thea Sinensis*), an evergreen shrub growing extensively in China, Japan, and India. The active principle in tea is an alkaloid called

thein, which is closely related to the *caffein* of coffee. The tea-leaves contain two to four per cent. of *thein*, and a considerable quantity of tannin, on account of which they must be scalded before a drinkable beverage can be prepared. In addition to these constituents, tea contains also certain characteristic aromatic substances. Green tea and black tea denote simply tea-leaves prepared by different methods. The former is prepared by steaming the leaves, thus retaining the original color; while the latter simply undergoes a process of drying. The quality of tea depends largely upon the size of the leaves, and also upon whether or not the stalks are used.

Tea, like coffee, contains little or no food value. By virtue of the *thein* it acts as a cerebral stimulant and as a cardiac excitant. The tannin is apt to cause constipation. Excessive tea drinking leads to sleeplessness, tremor, emaciation, constipation, and intense nervousness.

TEAR-GLAND AND TEAR-DUCT, DISEASES OF.—See LACRIMAL GLAND, SAC, AND DUCT, DISEASES OF.

TEETH, CARE OF.—In order to preserve the teeth as long as possible, and render the gums healthy and firm, due attention should be given to the cleaning of the mouth from the very beginning. The baby's mouth should be cleansed every day with a pledget of cotton dipped into a weak solution of boric acid. As soon as the teeth appear (usually at the beginning of the seventh month) they should be used. The child should not be fed exclusively on milk and paps, and other soft foods, but should be given slices of bread, and not be allowed to reject the crusts. It is just these coarse articles of food which are necessary to develop and strengthen the gums. Chewing increases the circulation of blood to the organs of mastication, and the teeth thus receive more nutriment and become stronger. A thorough utilization of the milk-teeth exerts a beneficial influence on the second and permanent set of teeth. The gums become firmer, and have greater power of resistance against injurious processes.

The cleansing of the child's mouth is of the greatest importance in order to prevent the accumulation of particles of milk or other food; for if such substances be allowed to remain, they will surely give rise to thrush and to digestive disturbances (see NURSING, CARE OF). The proper care of the mouth also insures healthy gums, and the child will bear the eruption of the milk-teeth without any disturbances. As soon as the milk-teeth begin to appear, they must be rubbed clean every day, preferably with a piece of cotton wound around a finger and dipped in a weak solution of boric acid or of listerine. When the milk-dentition, which consists of twenty teeth (ten in each jaw) is completed, a soft tooth-brush should be used. Neglect of the daily cleansing will cause milk and pap remnants to be deposited between the teeth. By the action of molds, the sugar and starch contained in these remnants are transformed into lactic acid, which destroys the enamel of the teeth and causes them to decay. This condition,

if progressive, gives rise to considerable pain. In order to avoid these harmful consequences, it is advisable to have a dentist examine the child's mouth twice a year. If lactic acid has formed on the teeth, it should be removed; and if carious spots exist, the cavities should be filled. If this be done in time, the dentist's work is almost painless. It is essential that the milk-teeth be kept in a healthy condition. If they be treated carelessly and allowed to decay, the permanent teeth will suffer in consequence. They will usually break through the gums with small black spots which indicate faulty enamel formation. It is a notorious fact that 99 per cent. of school-children have poor teeth, owing to neglect on the part of the parents.

When the permanent teeth appear, particular attention should be paid to their proper care. The first permanent tooth usually appears in the seventh

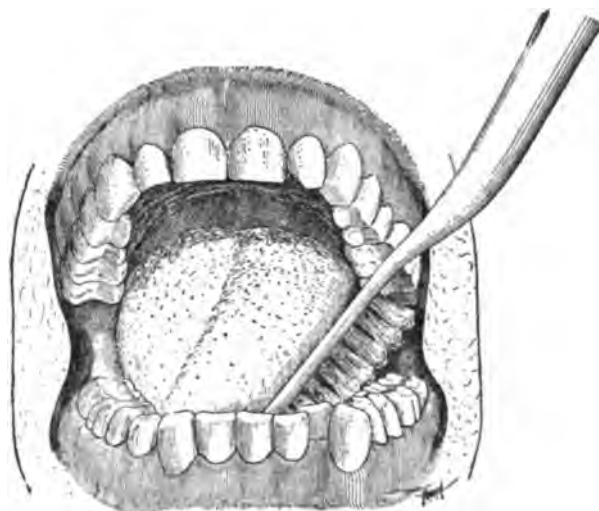


FIG. 412. Brushing the inner surface of the teeth.

year. The milk dentition consists of twenty teeth, five in each half of each jaw (two incisors, one canine, and two milk-molars); while the permanent set contains thirty-two teeth, or eight in each half of each jaw. The names of these permanent teeth are as follows, the right time of the eruption of the separate teeth being given in parentheses: two *incisors* (8th and 9th year); one *canine* (between 11th and 15th year); two *premolars* (between 10th and 15th year); and three *molars* (the first appearing at the 7th year; the second between the 13th and 16th year; and the third, which is called the *wisdom-tooth*, between the 18th and 30th year). From this it will be seen that the first permanent tooth to make its appearance is the first molar—the sixth tooth counting from the center of the jaw. This tooth is often taken to be a milk-tooth; and on the erroneous supposition that it will be displaced by another tooth, its care is often neglected so that it decays in a comparatively short time. It should, therefore, be remembered that this is a permanent

tooth, which will *not* be replaced when lost. It is the largest tooth in the mouth, and the best masticator; and during the period of change it has to perform the greater part of the work of chewing.

If a permanent tooth break through at a wrong place, it should immediately be corrected by the dentist. When this is done early, it presents no difficulties, for the tooth will take its proper position if the necessary space be prepared for it. If, however, the tooth is allowed to remain in a faulty position until it has grown to its full size, splints may be necessary to correct the malposition. Such occurrences may be avoided by having the mouth regularly examined by a dentist.

The importance of having healthy teeth should not be underrated. The process of digestion begins with the act of chewing, by which the food is reduced to small particles, admitting of easy action by the gastric juice. In the mouth the food also becomes moistened by saliva, which transforms starches into sugar, thus aiding digestion. The more thoroughly the food is masticated, the longer does it remain in the mouth, and the more intimately does it become mixed with saliva. But if one or more teeth be diseased and painful, the affected side of the jaw takes no part in mastication; and as a consequence the food becomes insufficiently chewed, and is not mixed with an adequate amount of saliva. This makes it necessary for the intestine to perform the additional task which under normal conditions should have been done by the saliva; and this overtaxing of the intestine inevitably results in digestive disturbances.

Carious teeth, or teeth with decayed roots, often cause disastrous disturbances to digestion. Food remnants, collecting in the cavities, afford good breeding-places for all kinds of bacteria. Even a healthy mouth harbors numerous bacteria, and it stands to reason that a mouth which offers such a fertile soil for their propagation contains a still greater number. At every meal some of these micro-organisms, together with the decayed matter in which they are lodged, are swallowed with each morsel of food; and the effects from the repeated ingestion of these poisonous elements can not be neutralized by the intestinal tract. It becomes irritated, and gives rise to a considerable degree of indigestion. Aside from this, decayed teeth impart a very disagreeable odor to the breath. To convince oneself of the nauseating, fetid smell arising from the decay of tooth-pulp, it is only necessary to introduce a piece of cotton into the cavity (for instance, by twining it around a match), and then smell it. It, therefore, becomes a duty to one's fellowmen to keep the mouth and teeth clean and healthy.

The teeth are instruments of speech, besides being primarily the instruments of mastication. The loss of even a single tooth causes difficulty in pronunciation, and produces disagreeable sibilant sounds which make speech indistinct. Persons gradually become accustomed to small gaps, and learn to let the teeth of the lower jaw take the place of lost ones in the

upper jaw, or *vice versa*. But if the corresponding teeth in the other jaw be also missing, speaking becomes a matter of more difficulty. Attention should, therefore, be paid to the care and preservation of children's milk-teeth; otherwise they may not learn to speak correctly, and their mental development may be retarded.

Another disagreeable result of missing teeth, or of large cavities in the incisors, is the constant outflow of saliva which can not be retained. Even when the mouth and teeth are healthy, the disease-germs which are always present in the mouth are thrown off with every drop of saliva. In the

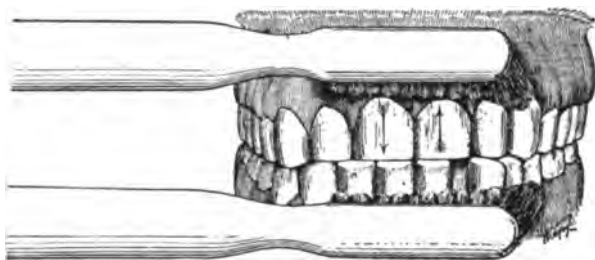


FIG. 413. Correct way of brushing the front teeth (in the directions of the arrows).

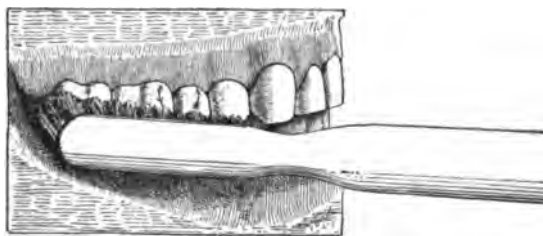


FIG. 414. Correct way of brushing the side teeth (in the directions of the arrows).

presence of decayed teeth, or of inflammatory affections of the mucous membrane of the mouth, a still larger number of such disease-producing bacteria are ejected with the spit. When the saliva evaporates on sidewalks or in other public places, the micro-organisms are set free, constituting a menace to the health of other people. For this reason one should always spit in cuspidors containing some water or, better yet, some anti-septic solution; and, above all, one should abstain from spitting in public conveyances or on the floors of public buildings.

The effect on the facial appearance caused by decayed, missing, or irregularly formed teeth, is sometimes very marring. An otherwise pleasant face may appear positively ugly when decayed or yellow teeth are displayed every time the person opens his mouth, or when the rows of teeth are broken by black gaps. On the other hand, a set of healthy, white teeth lends a charm to even a less attractive face. If an entire set of teeth is missing, the

face becomes deformed. The cheeks and lips become sunken, and the face takes on the appearance of old age.

Certain articles of food affect the teeth badly. The continued use of acid medicines works direct harm, as does also the fruit acids ingested when undergoing a grape-cure. In such cases double vigilance in caring for the cleanness of mouth and teeth becomes necessary. Sugary and starchy foods are likewise harmful to the teeth, especially when eaten in the form of sticky candy. If remnants of such foods be allowed to remain for any length of time between the teeth, lactic acid, which is very destructive to the teeth, develops. Sugar, chocolate, etc., are otherwise nourishing and wholesome articles of food; and if the mouth and teeth be thoroughly cleansed after eating such substances, no harm will ensue.

Smoking has no detrimental effect on the teeth. The brownish discoloration often noticed on the teeth of constant smokers is only external, and may be easily removed. In certain respects the smoke prevents decay and stems fermentation. On the other hand, it acts as a corrosive on the gums and mucous membrane, and for this reason excessive smokers rarely have healthy mucous membranes in the mouth.

The chief care of the teeth consists in cleansing or brushing them regularly. Chewing hard bread thoroughly tends to clean and preserve the teeth. For this reason some uncivilized races, and persons who eat coarse food, have beautiful teeth without resorting to any mechanical care of them. In rinsing the mouth, warm water is preferable to cold water, because the former more readily dissolves and removes tough and fatty remnants of food. To remove particles of food from the spaces between the teeth, a tooth-brush is necessary. The shape of the tooth-brush is less important than its skilful handling. Brushing should be done, not only on the visible surfaces, but over all the surfaces that can be reached. The chewing-surfaces should be well brushed, as should also the furrows in the molars, where food remnants which can not be removed by the tongue are most likely to become lodged. Also the back surfaces of the teeth (facing the tongue) should be carefully brushed (see Fig. 412). The tooth-brush should not be passed over the teeth from side to side, but with up and down movements, the upper row being brushed from above downward and the lower row from below upward (see Figs. 413 and 414). If the teeth be brushed sideways, it tends to force the food remnants into the interspaces instead of removing them. By brushing the teeth in the proper direction, the gums also derive the benefit of a mild massage which makes them firm and tense. Otherwise they are apt to become flabby, inflame readily, and bleed at every touch. At first the brushing of the gums may cause them to bleed, it is true; but this will be for a few days only, and afterward they will be healthier and firmer.

The tooth-brush should not be too hard, since this may cause injury to the gums. Bristles of medium stiffness are to be preferred. After using,

the tooth-brush should be thoroughly rinsed, and dried in the fresh air. Air-tight tooth-brush holders are very inappropriate, as they keep the bristles damp and cause them to rot. It is much better to hang up the tooth-brush on a nail. No two persons should ever use one tooth-brush in common.

A tooth-pick is useful for removing food remnants which can not be reached by the tooth-brush. Soft, quill tooth-picks are preferable to wooden ones. After using a tooth-pick it is advisable to rinse the mouth with warm water in order to remove the loosened particles of food. When the teeth are so close together as to prevent the introduction of a tooth-pick, a waxed silken thread is effectual.

A good tooth-powder enhances the effects produced by water and brush. The powder must be very finely pulverized, and should contain no gritty substances. The main basis of all tooth-powders is an alkaline carbonate which, in addition to its mechanical effect, also serves to neutralize the effects of acids and the dangerous consequences caused by the presence of the bacillus of caries. The more powerful alkalies, soluble in water, are not adapted for use in tooth-powders, as they corrode the mucous membrane. For this reason great caution is necessary when selecting tooth-soap or tooth-paste, as even the best soap develops free alkali when brought in contact with spring-water containing lime. Tooth-paste consists principally of tooth-powder and soap, with an admixture of glycerin. The color of the tooth-powder is immaterial, since it is due merely to an admixture of coloring-matter. Tooth-powder containing linden-wood coal renders the gums black or blue along the edges, and the discoloration rarely disappears. Pulverized oyster-shells, cuttlebone, pumice, and cigar ashes are too coarse and gritty, and affect the enamel too severely. Tooth-powders that in a very short time give the teeth a dazzling white appearance, contain free acids which dissolve the enamel, and should therefore be particularly avoided. The addition of an antiseptic to the tooth-powder is of little value, since it does not dissolve completely in the short period of time it takes to brush the teeth.

After the teeth have been cleansed with a tooth-brush and powder, the mouth must be thoroughly rinsed several times. Scented mouth-washes have been in use for ages. Many persons are of the opinion that rinsing the mouth with an antiseptic wash is sufficient for the cleansing of the teeth, especially as many manufacturers of these mouth-washes advertise this as being the case. But this is not so. The mechanical action of the tooth-brush and the powder is the main point; the use of antiseptic mouth-washes can merely aid the mechanical cleansing. An appropriate mouth-wash is one which is absolutely harmless to the teeth, to the mucous membrane, and to the body in general. It must be sufficiently antiseptic in its effect, and must have an agreeable taste and a pleasant odor. Many of the mouth-washes on the market do not fill these requisites, and are therefore often

injurious. An absolutely harmless mouth-wash consists in a simple solution of cooking-salt in warm water (one thimbleful of salt to a tumblerful of water). In order to rinse the mouth properly, the water must be forced between the teeth, and also be used as a gargle.

The teeth should be cleansed in the manner here stated morning and night. Cleansing at night is of the greatest importance, in order to prevent food deposited between the teeth from putrefying during the night when nothing can be done to remove it. The cleansing of the teeth in the morning is necessary to remove the mucus which has accumulated on the teeth over night. After each meal the mouth should be rinsed with warm water.

In case of toothache, a dentist should be consulted. The causes of toothache are so varied that it requires a certain degree of medical education to recognize the exact cause and apply the proper remedy. Remedies advertised in newspapers should be strictly avoided, for even though they may seem efficacious in some cases, their effects are rarely permanent. The trying of all kinds of remedies really amounts to no more than a useless waste of time, during which the pain merely becomes aggravated. Only a trained dentist is able to give prompt relief.



FIG. 415.



FIG. 416.

FIG. 415. Healthy tooth.

FIG. 416. Carious tooth with accumulation of pus at base of root.

The most frequent disease of the teeth is dental decay (*caries*), the cause, nature, and development of which have been described in the foregoing. When the enamel is broken in a small spot, the decay quickly invades the bone, and spreads to all sides until the enamel is undermined. Although the enamel may remain intact for the time being, the decay steadily progresses until suddenly a large portion breaks away, disclosing a cavity. It is, therefore, necessary to have one's teeth regularly examined by a dentist, so that such carious spots may be discovered as early as possible, and the progress of the decay arrested before pain sets in. When the carious process involves the pulp of the tooth (the so-called nerve), it gives rise to pain. At first there is a transient sensation of pain when drinking cold fluids or eating sweets. Gradually the pain becomes prolonged, occurring without any special outward cause; and unless treated it may last for months. The pain indicates that the pulp is inflamed in consequence of the entrance of suppurative bacteria. When the pulp is destroyed, the pain generally ceases for a time. Only for a time, however; for the decay advances further and further, gradually destroying the tooth until the entire crown breaks down. Food remnants are readily deposited in the mouth of the cavity, pressing upon the disintegrated contents which thus are forced into the root cavity.

These food remnants are accompanied by bacteria which cause suppu-

ration, and give rise to a so-called "inflammation of the root-membrane." For a time this condition may cause no annoyance, but sooner or later it will give rise to severe throbbing and piercing pain. That side of the face on which the sick tooth is situated becomes swollen, and pus accumulates around the base of the tooth (see Fig. 416). Near the tip of the root the pus usually breaks through the bony tooth-cells and gums, and is discharged into the mouth. This may result in a dental fistula which continuously secretes pus. The pus may also break through the cheek to the face. This latter condition gives rise to a so-called "cheek fistula," which never heals without leaving a disfiguring scar.

When a tooth aches, the mouth can not be thoroughly cleansed, and the affected side does not take any part in chewing. This causes tartar to form

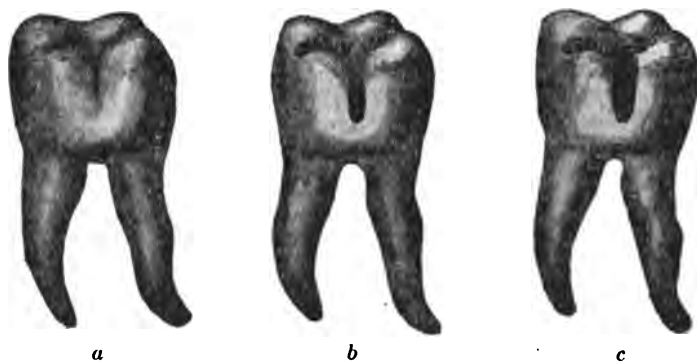


FIG. 417. *a*, Tooth with carious spots on side and on chewing-surface; *b*, same tooth improperly filled; *c*, proper filling.

also on the sound teeth. The tartar adheres principally to the neck of the tooth, from where it extends downward between the tooth and the gum, causing an insidious suppuration which frequently involves the jaw-bone also. This condition leads to destruction of the bone, and the tooth gradually loses its support and falls out. Owing to a large deposit of tartar intervening between the tooth and the gum, the latter no longer adheres closely to the root of the tooth, which is then merely supported by the tartar. Finally both tooth and tartar break down. In order to avoid this condition, tartar deposits should be removed in time, and the gums strengthened by massage and thorough cleansing.

In spite of proper care, the gums recede in old age; and the teeth, losing their support, fall out. In some persons the teeth begin to loosen at the age of forty, while others retain a complete set of teeth until the age of sixty or even seventy.

Careful dental treatment is absolutely necessary in order to remedy the injury wrought by caries. If the cavities be filled while they are still small, and before they have become painful, the treatment will cause but little pain. Before filling the cavity, it is necessary that the diseased tissue be

removed. This will generally cause some pain; and it is safe to say that in many cases dentists who perform this operation painlessly do so at the sacrifice of thoroughness. If diseased tissue be allowed to remain in the cavity, it will sooner or later give rise to further decay. A conscientious dentist often finds only one cavity to fill, where a superficial bungler will find two or three (see Fig. 417). The work of a dentist, therefore, should not be judged by the number of fillings made, but by their quality. The choice of the substance to be used for the filling should be left to the dentist's judgment, for while he is preparing the cavity he is able to decide whether a filling of gold or of an amalgam would be the more suitable. If an amalgam filling be used, its surface should be thoroughly smoothed (polished) as soon as it has become hard, as this will greatly increase its durability.

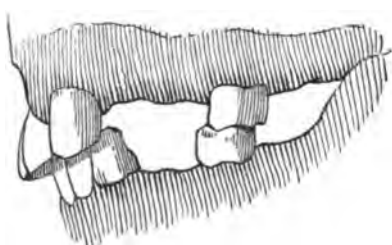


FIG. 418. Two remaining serviceable molars.

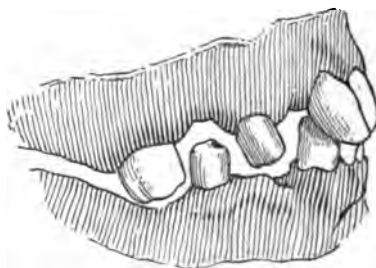


FIG. 419. Three remaining useless molars.

Inflamed pulp can not be preserved, but must be deadened by means of some corrosive substance. If properly done, this is an almost entirely painless procedure. After a day or two the nerve generally becomes devoid of sensation, whereupon it is removed and the cavity filled. If this removal of the nerve be neglected—as is often the case with some bunglers in dentistry—an inflammation of the root membrane results. Teeth in which the pulp is already decayed, as well as firm and healthy roots, need merely to be filled after thorough cleansing and disinfecting of the root canals.

The extraction of a tooth becomes necessary when the root is decayed beyond possibility of preservation. Food remnants and mucus can never be entirely removed from hollow roots and stumps. These are, therefore, a constant menace to the healthy teeth, and are frequent causes of disease, particularly of stomach troubles. The supposition that a tooth should not be extracted while the gum is swollen is a wide-spread but erroneous impression. The diseased tooth is the cause of the swelling, and the latter recedes when the former is removed. Timely extraction of a tooth obviates the necessity of draining off the accumulated pus by incision into the gum. No tooth, however, should be extracted unless it is absolutely impossible to preserve it, since its removal often renders the corresponding tooth in the other jaw unfit for chewing (see Figs. 418, 419). For this reason it is often necessary to provide an artificial tooth in place of the one removed.

Artificial teeth are nowadays made with a high degree of perfection. If, after the loss of the crown of a tooth, it is still possible to preserve the root, the latter may be used for the support of an artificial crown made of porcelain or of gold. Bridge-work is a combination of several crowns, forming a single apparatus, which is made without a plate, and fastened to two or three supporting roots. Natural teeth which are filled, or provided with new crowns, are much more useful for mastication than are artificial plates, although the latter are very useful when the roots are absolutely beyond preservation. These artificial plates are made of gold or of India rubber. Before inserting the artificial plate, the decayed roots must be extracted; for there is no filthier and more unhygienic habit than wearing an artificial plate over decayed, unfilled roots. The majority of people do not feel the want of artificial teeth until visible front teeth are gone, and usually wish to have only these replaced. It should be remembered, however, that artificial teeth serve not only to hide cosmetic defects, but also to promote mastication. For this reason, not only anterior, but also lateral teeth should be replaced when necessary. The effect of missing teeth on the clearness of speech has been discussed in a preceding paragraph of this article.

Artificial plates must be kept scrupulously clean, so as not to become a source of infection for the remaining natural teeth. It is advisable to cleanse the mouth and the plate thoroughly after each meal. At night the plate should be kept in a vessel filled with some antiseptic fluid, such as a boric acid solution.

TEETHING.—See NURSING, CARE OF; TEETH, CARE OF.

TESTICLES, DISEASES OF.—Deformities, injuries, inflammations, and tumors of the testicles are not uncommon affections. At about the ninth month of fetal life, the testicles descend from the abdominal cavity into the scrotum through the inguinal canal. This descent, however, is sometimes hindered, so that a testicle may remain either in the abdominal cavity (abdominal testicle) or in the fold of the groin (inguinal testicle). When the latter deformity exists, the movements of walking may cause considerable pain; and the swelling in the groin may simulate an inguinal rupture.

Injuries to the testicles occur relatively often, contusions from riding or from practising gymnastic exercises being the most common. Following such a contusion, a quantity of blood accumulates in the scrotum, causing the latter to become swollen and painful. Rest and moist poultices will relieve the pain, and promote the absorption of the blood.

Inflammation of the testicles (*orchitis*) is a not infrequent affection. It may be either acute or chronic. The former condition may occur in infectious diseases (especially in mumps); or an inflammation may spread from the scrotum to the testicles (for instance, in erysipelas of the scrotum). Chronic inflammations of the testicles are usually tuberculous or venereal

in nature; and in these cases treatment of the general affection is the main point. Orchitis must not be confounded with inflammation of the epididymis. See EPIDIDYMITIS.

The testicles may become the seat of tumors—of benign as well as of malignant. Operative treatment is the only recourse in such cases.

TETANUS (LOCKJAW).—A disease caused by infection of a wound with the bacillus of tetanus, a micro-organism present in the earth. People who work in the earth may become infected by getting splinters of wood under the nails. Infection may likewise occur from the improper application of mud-compresses and mud-baths. Fourth of July wounds from toy pistols are frequent sources of infection in the United States. The symptoms of tetanus appear from five to ten days after infection, the earliest manifestation being a feeling of tension in the muscles of the lower jaw, of the neck, and of the throat; this renders swallowing difficult. The feeling of tension is followed by spasms of the masseter (the masticatory muscle passing from the zygomatic arch to the lower jaw), and of the muscles of the neck and back. Finally, the muscles of the limbs, and the muscles governing respiration become affected. All the affected muscles become exceedingly tense, and hard as boards. This abnormal tension during the convulsion gives rise to great pain. Neither consciousness nor sensation is disturbed. The patient often perspires freely and has a high temperature.

The treatment of lockjaw must be begun immediately after infection, in order to be at all hopeful. Unless this is done, the disease is usually fatal. Treatment consists in cleaning the wound, and in giving injections of an anti-tetanus serum. If this serum be applied in time, the result may be favorable. Sedatives are beneficial to counteract the muscular spasms; and it is advisable to give the patient lukewarm baths. Nourishment must be administered through a tube or funnel. The intracranial injection of weak solutions of magnesium sulfate has proved beneficial in some cases.

TETTER.—An old-fashioned name used to signify a variety of eruptive skin disorders. These are considered under their respective headings. See HERPES; RINGWORM; SKIN, DISEASES OF.

THEIN.—See TEA.

THIRST.—A physiological phenomenon which constitutes one of the most pressing of human necessities. Man's craving for water is only exceeded by his need of oxygen; and this is readily understood if it be remembered that of the total weight of the body, 58.5 per cent., or more than one-half, is made up of water. Man requires an endless supply of moisture for his tissues, although at the same time he is constantly excreting water through the skin, the lungs, the kidneys, and the intestines. This loss need not necessarily be compensated for by extra drinking; for fruit, vegetables, and other foods aid the body in keeping up its necessary proportion of

moisture in the tissues; and the other fluids taken during the day serve to supply the actual daily requirement, which amounts to about three quarts. In hot weather, or by bodily exertion, the thirst may be increased on account of the greater loss of water through the skin in the perspiration. It is not well, however, to give in to this thirst too readily, as the ingestion of large quantities of fluid only increases the exudation. In hot weather, one should be content with a few swallows of water taken slowly. Strongly spiced dishes also increase the thirst, a point to be noted by housewives for their guidance.

THORN-APPLE POISONING.—The thorn-apple, or jimson-weed, is a common weed of the nightshade family, the seeds and leaves of which contain a poisonous substance known as STRAMONIUM (which see). The



FIG. 420. Seed of the thorn-apple.

FIG. 421. Fruits of thorn-apple (left) and horse-chestnut (right).

capsules of this weed have been mistaken by children for horse-chestnuts, and the poisonous seeds accidentally swallowed (see Figs. 420, 421). Adults have been poisoned by using the leaves of the plant as a domestic remedy for stitches in the side. The symptoms of thorn-apple poisoning resemble those caused by BELLADONNA-POISONING, and the treatment is the same in both cases: emetics, cold compresses to the head, etc.

THREADWORMS.—See FILARIA; WORMS.

THRUSH.—See NURSING, CARE OF.

THYMOL.—A compound substance occurring in large colorless crystals. It is obtained from the common thyme and from several other plants. Its action is much like that of carbolic acid, but its odor and taste are much more agreeable. Thymol is sometimes used as an intestinal disinfectant, and for intestinal parasites. It is not an uncommon ingredient in gargles and mouth-washes. The dose is one or two grains.

THYROID GLAND, DISEASES OF.—The thyroid gland is an organ situated in the neck and belonging to the group of what are called the duct-

less glands (see p. 51). These are structures which, although resembling other glands (like the pancreas or salivary glands) in their general make-up, differ from these in not having any apparent outlet through which to pour out the products they manufacture. Other glands belonging to this class are the thymus gland, the suprarenal capsules, and the spleen. Although it has been very difficult to find out much about the functions of these organs, and even now a great deal remains to be learned concerning them, they seem, through the agency of the blood-stream that circulates through them, to play a considerable part in controlling the complicated chemical and other processes that are constantly going on in the living body.

The thyroid gland consists of two halves which are situated on either side of the trachea or windpipe near the level of the larynx (Adam's apple), and are connected by a bridge of gland-tissue passing in front of the windpipe and called the *isthmus* of the gland. The entire organ usually weighs about one and one-half ounces, and is proportionately larger in women than in men. It is composed of a very large number of minute cavities lined with a single layer of cells, and filled with a glairy, mucous-like substance; and it has a very rich blood-supply. Although it was long ago recognized that the swelling in the neck called *goiter* was due to enlargement of the thyroid gland, it is only comparatively recently that any real understanding of the function of the organ in relation to the general working of the body has been gained. Surgeons observed that, if in performing operations for the cure of goiter, the precaution was not taken of leaving behind a small portion of the gland, very serious disturbances to the health of the patient resulted. The experiment was then made of removing the gland completely from animals, such as dogs or cats, and it was discovered that this always resulted in the death of the animal from general weakness and inability to absorb nourishment, within about four weeks. It was furthermore found by experimenting on animals, that if the gland was completely removed from the neck, but a small portion was transplanted to the interior of the abdominal cavity, death did not follow. The very great importance of the thyroid gland in preserving the general health was thus demonstrated, but it has not been possible to find out in just what way the gland exerts its influence. Two main theories have been suggested: (1) that the gland manufactures some product which enters the blood and has an effect on the body processes, and (2) that the gland in some way neutralizes or alters harmful substances carried to it by the blood-stream. While the question is not yet settled, most authorities incline to the former view, though it is not impossible that, to some extent at least, the gland may perform both offices.

The diseases of the thyroid gland may be divided into three main groups: (1) Tumors of the thyroid gland, or goiter; (2) exophthalmic goiter, which is the result of over-activity of the gland; (3) myxedema and cretinism, which are conditions due to insufficient activity or absence of the gland.

Goiter.—Like all other glands the thyroid is sometimes the seat of cancer, but the disease in this situation does not differ in any important feature from cancer in other parts of the body, and it is mentioned here only to emphasize the necessity for obtaining medical advice at once when any swelling in the neck is noticed, as only prompt treatment can save life if cancer is present. The most frequent disease of the thyroid gland is simple goiter. This consists of an enlargement of one or both halves of the gland, which may be so slight as to cause only moderate thickening of the neck, or may be so extreme that a large tumor results. At the age of puberty a slight enlargement of the thyroid gland is frequently seen in girls, and some women at each menstrual period manifest a noticeable increase in the circumference of the neck, but this is due only to congestion of the gland and usually does not lead to any permanent change. There are some parts of the world (for instance, certain regions in Switzerland, Italy, France, and England) in which goiter is very common and the growths attain great size. In the United States it is said to be most common about the Great Lakes and in the mountainous regions of Pennsylvania, but most cases of goiter are simply scattered instances of the disease and do not have any relation to a particular locality. The cause of goiter is still unexplained, though in a general way it is known that some peculiarity of the drinking-water is largely responsible for the frequency with which the disease occurs in the special districts just mentioned. Blows or injuries to the front of the neck, tight neckbands, and the practise of carrying loads on the head are said to favor the development of goiter; but these are probably not very active causes. The affection is much more common in women than in men, and is a disease of early or middle life.

A goiter of small or even moderate size may not give rise to any symptoms, but if large it may press on the windpipe, nerves, blood-vessels, or other neighboring structures, thus causing shortness of breath, difficulty in swallowing, hoarseness, etc., and sometimes sudden death. The use of drugs or of local applications is of but little service, though sometimes change of locality is beneficial; and in regions where goiter is common the drinking-water should be filtered and boiled. If the goiter is increasing in size, causes inconvenience, or is disfiguring, surgical treatment should be resorted to. The operation is usually not difficult for a competent surgeon, and involves very little danger.

Exophthalmic goiter (known also as Graves' disease, or Basedow's disease) receives its name from its most conspicuous symptom, the so-called *exophthalmos*, which means protrusion of the eyes. Persons suffering from this form of goiter have a peculiar staring expression owing to the fact that the eyes are prominent, appear enlarged, and often show a strip of white above and below the pupil, the lids being pushed further apart than normal. "Pop-eyed" is a common term used to describe this symptom. In addition

to the goiter and the eye symptoms there are usually present rapid and irregular heart-action, often giving rise to attacks of palpitation of the heart, throbbing of the blood-vessels in the neck, trembling of the hands and lips, extreme nervousness, irritability, and anemia. The absence of one or more of these symptoms, even of the goiter itself, is perfectly possible, however. Exophthalmic goiter is much more often seen in women than in men, and usually appears during the third decade of life. It is commoner in nervous, excitable people, and in persons in whose families the disease has already occurred; and it sometimes develops as a consequence of simple goiter. Lack of good food, overwork, emotional strains, exhausting diseases, etc.,—that is, all conditions which lessen the physical and mental vigor—are likely to have a share in bringing on the condition. It is usually considered that exophthalmic goiter is the result of over-activity of the thyroid gland, so that the system is overcharged with substances which stimulate the action of the heart and the nervous system. The condition is the exact opposite of the disease next to be described, *myxedema*, which is due to a lack of the proper amount of thyroid activity; and the two classes of patients present a profound contrast in appearance. In the former case there is great nervous unrest and excitability, flushed, moist, warm skin, and over-action of the heart; while in the latter case there is stupidity, loss of memory, slow speech, a dry harsh skin, and lack of facial expression. Exophthalmic goiter is always a serious condition, and requires medical treatment as soon as it is recognized. In mild cases a great deal may be accomplished by rest in bed with the local application of an ice-bag to calm the heart's action, and by certain drugs. In cases that do not improve under medical treatment, surgical measures are advisable and often effect a cure.

Myxedema and Cretinism.—When there is deficiency of function of the thyroid gland there results, as has already been indicated, a peculiar change in the physical and mental functions and in the structure of the body, this condition being called *myxedema* when it occurs in adults, and *cretinism* when it begins in childhood. Myxedema is six times more common in women than in men, and is most often seen between the ages of thirty and sixty years. The physical and mental changes are very striking: the surface of the body becomes swollen so that the lips and nose are thickened and all the features grow coarse, the face loses its play of expression, the hands and feet enlarge, the skin becomes rough and dry, the hair falls out, the patient suffers from cold, the voice becomes hoarse and monotonous, speech is slow and halting, and there are mental depression and stupidity sometimes combined with delusions and hallucinations. The thyroid gland undergoes diminution in size, and finally may waste away completely. In spite of the profound disturbance of the general functions, the disease progresses but slowly, and the patient may live in this pitiable condition for ten or fifteen years. Myxedema may follow operations for goiter in

which no part of the gland is left behind, and sometimes it is a late sequel in cases of exophthalmic goiter.

Cretinism is much more frequent in parts of Central Europe than in the United States; but as the knowledge of the nature of the condition is becoming more wide-spread, more and more cases are being recognized on this continent also. It is not usually noted until the child is about six months old, after which period a remarkable tardiness in development becomes apparent. Growth is slow, the features become coarse, the skin is dry and



FIG. 422. Child suffering from cretinism.

FIG. 423. Same child after six months' treatment.

rough, the teeth are slow to appear, and mental development is greatly retarded. As the child grows older the abdomen becomes protuberant, the hair is straight and coarse, the fingers become thick and clumsy, the head is disproportionately large, and the expression is vacant and stupid (see Fig. 422). An individual of fifteen or sixteen years may be only three feet in height. Cretins are usually dull mentally, but good-natured, and are likely to become complete idiots. See **IMBECILITY**.

In few conditions has modern medicine achieved such triumphs as in the treatment of myxedema and cretinism. Patients with myxedema, who were formerly considered beyond human aid, can now be restored to their normal condition, and even advanced cretins can be enabled to take care of themselves. This is effected by artificially supplying to the system

the thyroid substance which its own gland does not furnish. An extract obtained from the thyroid glands of sheep is used, and under its daily administration the various manifestations of the disease disappear little by little, until finally a complete cure is effected. It is necessary, however, for the patients to continue taking the extract all their lives in order to prevent relapse.

TIGHT-LACE LIVER.—See DRESS.

TINCTURES.—By this term is understood certain preparations, in which the medicinal substances are dissolved in alcohol by means of maceration or percolation. The latter process, which is by far the more common, takes place as follows: In the neck of the percolator (a cylindrical or conical glass funnel of varying size) is inserted a tuft of cotton, over which is spread a clean layer of sand or gravel. The drug to be percolated is more or less finely powdered, whereupon it is uniformly moistened with alcohol, and firmly packed in the percolator. On top of the drug is placed a disk of filtering paper, whereupon the menstruum is gradually poured on top of this. The alcohol slowly filters through the closely packed drug, absorbing its active principles, and percolating into a covered receptacle drop by drop. The pharmacopœia directs the strength of the various tinctures, as well as variations in the manner of their preparation.

TOBACCO.—When compared with alcohol, tobacco may be called a harmless agent; but if used foolishly or in excessive amounts it may have bad effects upon the general health. Yet, even in the severest cases, tobacco is injurious only to the consumer. It rarely means the destruction of entire families.

Smoked in moderation, tobacco has a slightly stimulating effect. In addition to nicotin, which acts as a strong poison on muscular tissue (including that of the heart), tobacco contains other elements which probably are the chief cause of certain gastric disorders affecting excessive smokers. A portion of the smoke adheres to the saliva and mucus in the mouth, together with which it enters the stomach, where it causes irritation. The habit of swallowing smoke is therefore doubly foolish. In the same way, exhaling smoke through the nose may cause catarrh of the throat. The use of snuff not only affects the throat, but also the stomach, as a great part of the snuff is swallowed. Chewing tobacco is also objectionable, for, like smoke, it seriously affects the mucous membrane of the mouth. It is least injurious to smoke a mild cigar after a full meal.

Excessive smoking causes a rapid and irritable heart-action, catarrh of the nose and throat, and much tremor and nervousness; it may even cause serious heart-muscle deterioration. The chief disadvantage in cigarette smoking is due to the habit of inhaling the smoke.

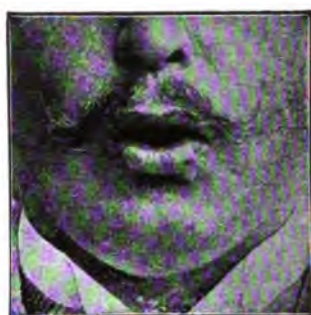
TOBACCO-POISONING.—Acute poisoning from tobacco may occur in people who are just beginning to smoke, or it may be due to the excessive



A as in Fare



E as in Eight



O as in No



A as in Fare



E as in Eight



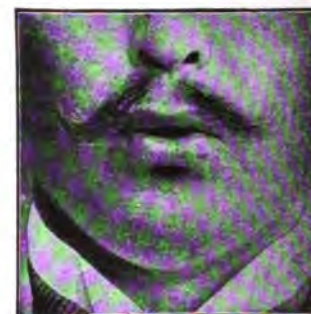
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I as in Machine



U as in Rule



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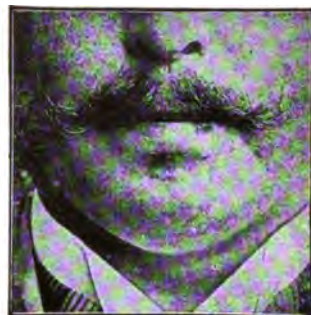
FORMING SOUNDS FOR LIP-READING



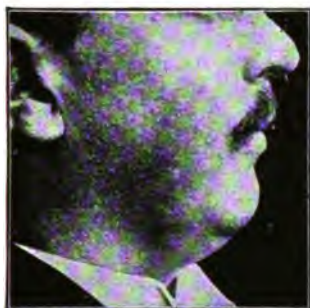
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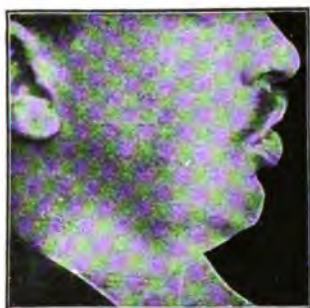
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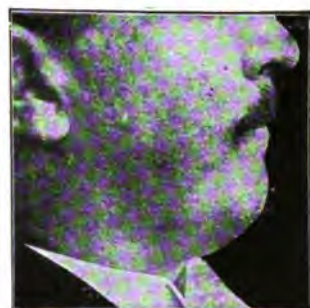
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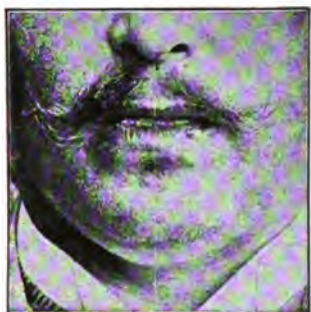
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smoking of habitués. It may arise also in consequence of chewing tobacco-leaves, or of the foolish use of tobacco-juice as an internal remedy for tape-worm and diphtheria, or as an external application for the itch or other skin eruptions.

A chronic type of poisoning frequently develops in consequence of excessive habitual smoking and chewing. It is characterized by nervous symptoms, such as neuralgic pains, headache, moodiness, unrefreshing sleep or sleeplessness, fainting spells, fear, difficult respiration and heart-action, slow and irregular pulse, fatigue, trembling, stomach-ache, colic, irregular bowel movements, loss in weight, and disturbances of vision. The last symptom may be more or less severe, the sense of sight being in some cases only slightly impaired, in others almost totally lost.

The only remedy for tobacco-poisoning consists in total abstinence from tobacco. When this is done the symptoms usually disappear in a very short time. After a cure has been effected, tobacco should be used in moderation, and only if the physician permits it. A physician should always be consulted in cases of tobacco-poisoning, as some of the symptoms, particularly those pertaining to the heart and to the eyes, are serious and threatening.

TONGUE, CANCER OF.—Among the tumors that may infect the tongue, cancer plays the most important rôle. It generally begins in the epithelial tissue of the tongue, in the form of firm, well-defined nodules which at first cause no particular annoyance. Within a short time, however, severe pain sets in, and the motility of the tongue is interfered with. In other cases the cancer develops on the surface of the tongue, in the form of an ulcer, with hard, and generally raised margins. The nodular form of cancer also rapidly develops into an ulcer. As the growth of tongue cancer is very rapid, it is important that any abscesses or ulcers developing on the tongue be examined by a physician as soon as possible. If the physician decides that operative treatment is necessary, the patient should not waste any time in considering the matter, but should subject himself as quickly as possible to the operation.

TONGUE, DISEASES OF.—Various diseases of the mouth are accompanied with inflammation of the mucous membrane of the tongue. The tissue of the tongue may become inflamed after insect bites, as a consequence of burning with hot food, after slight wounds, or during the course of anthrax, erysipelas, abdominal typhoid, etc. Such inflammation may be followed (happily very seldom) by severe swelling of the tongue, which may result in death by suffocation. The inflammation, and resultant swelling of the tongue causes pain, difficulty in swallowing, and increased flow of saliva; it generally abates under medical treatment, however. Abscesses or gangrene, which demand operative interference, occasionally occur. Ulcers of the tongue arise in consequence of wounds, or as a result of syphilis, tuberculosis, or cancer.

TONGUE-TIE.—In some children the ligament, or frenum, of the tongue may be abnormally short, or may reach forward toward the point of the tongue; and in rare cases this condition may cause difficulty in nursing. As a rule, however, it is not necessary to perform an operation. If a child nurses with difficulty, the physician must decide regarding the necessary measures; and if an operation be indicated, it must be performed by him only, as bungling may injure arteries and lead to death from bleeding. Stress must be laid on the fact that a short frenum does not cause faulty speech.

TONICS.—See DOMESTIC REMEDIES.

TONSILLITIS.—Inflammation of the tonsils. This is a very frequent affection, especially of children, and may occur in various forms. The most important types of the disease are discussed in the following:

Simple, or catarrhal, tonsillitis consists of a mild infection of the crypts of the tonsils. The chief symptoms are: pain on swallowing (often radiating into the ear), slight fever, pain in the back, and sometimes headache. The tonsil appears red and glistening, and projects more than usual into the pharynx. The patient experiences a sensation as of scratching and pricking in the throat. In some cases the inflammation disappears in from 24 to 48 hours; in others, a coryza or a catarrh of the larynx develops. The disease is only in rare instances followed by rheumatism, pleurisy, etc.

Follicular tonsillitis is a more severe form of the preceding type, and is characterized by graver symptoms, higher fever, and a more protracted course. This affection usually sets in with high fever (often with a violent chill), and with general lassitude and loss of appetite. The tonsils swell rapidly, as do also the lymph-glands under the chin, which likewise become painful. On the second day of the affection, isolated yellow spots, of the size of pin-heads, are observed in the follicles of the tonsils. The fever usually lasts three days, the nights are restless, and great bodily discomfort is felt. This form of tonsillitis is often associated with inflammation of the middle ear (see EAR, DISEASES OF). After the fever has subsided, marked weakness remains, and recovery is slow. Rheumatic sequelæ are not infrequent.

Ulcerative tonsillitis (quinsy) is a condition often developing from follicular tonsillitis when, especially if deep infection take place, pus may collect in the deeper tissues of the tonsils. In this affection the mouth can be opened only with difficulty, and swallowing, even of the saliva, is excessively painful. The tongue is heavily coated, and ingestion of food is rendered very difficult, or even impossible. The patient is usually very sick. High temperature is present, and the glands of the neck become swollen and painful. The process is one of abscess formation in the tonsil, and recovery does not take place until the abscess is opened. This is best done by a knife, when relief takes place at once. If the abscess ruptures spontaneously, it may do so either into the mouth (sometimes during sleep), or it may burrow down the

neck and result in serious blood-poisoning. The affection lasts at least two weeks, and may attack both sides successively.

Suppurative tonsillitis in scarlet fever is distinguished from ordinary diphtheria by its appearance, course, and consequences; and it is usually regarded as a part manifestation of scarlet fever following it.

Chronic tonsillitic affections, unaccompanied by fever, consist either in a cornification of the surface of the tonsils, with a colonization of white fungi, or in enlargement of the tonsils. The former condition is harmless, but the white patches are often mistaken for those of diphtheria. Enlarged tonsils are often due to some individual or family predisposition; frequent inflammations are rarely the cause.

The belief of many lay persons, that swellings situated back of the lower jaw, below the ear, are enlarged tonsils, is incorrect. These are usually swollen lymph-glands.

The treatment of simple follicular tonsillitis calls for the use of cold or hot compresses around the throat, the drinking of cold beverages (milk, lemonade, iced chocolate, etc.), and avoidance of solid or hot foods. The diet should consist preferably of milk, cream, raw or soft-boiled eggs, broths, etc. Gargling the throat with an alkaline antiseptic is preeminently of mechanical benefit and of germicidal value. Treatment of the fever by drugs, notably salicylates, improves the general condition, and sometimes produces sleep. In quinsy, or tonsillar abscess, it is essential to open the abscess as soon as possible.

Permanently enlarged tonsils should be operated upon, if necessary. After the period of adult growth, the tonsils gradually become smaller; and in advanced age they disappear entirely.

TRACHOMA.—See *Granular Conjunctivitis*, s. v. EYE, DISEASES OF.

TRICHINOSIS.—An infectious disease due to a worm-like parasite, the *Trichina spiralis*. The disease was demonstrated in 1860 by Zenker, and shortly after Virchow demonstrated the process of evolution of the parasite. The worm enters the human body through the eating of pork which contains the parasite. Since cooking destroys it, the chief source of contamination lies in raw or smoked pork. Swine are infected by eating the feces of trichinous persons, or by eating the flesh of infected rats.

The *Trichina spiralis* is observed in two forms, according to whether it appears in the intestinal canal or in the muscular tissue (see Fig. 424). When the encapsulated muscle-trichinæ are swallowed, they get into the stomach, where the capsules are opened and the trichinæ set free. These thereupon enter the intestine, where they are developed into full-grown worms, attaining a size of from $\frac{1}{12}$ to $\frac{1}{8}$ of an inch. The embryos are developed from eggs within the body of the female worm, and are born alive. A single trichina is supposed to bear more than 1,000 young. Soon after birth, the embryos begin their wanderings through the intestinal wall, or

through the lymphatic vessels of the intestine, into the body-tissues. They are prone to lodge in the muscles, rolled up as spirals, where they encapsulate, either singly or in groups, in lime-encrusted cysts (see Fig. 425). This encapsulation completes their development.

Trichinæ lodge mostly in the muscles of the neck, larynx, diaphragm, and upper arm; they are very resistant, and usually live as long as the person on whom they feed. In some cases trichinæ have been accidentally found at autopsies, their presence not having been suspected during the lifetime of the patient.

In most cases, however, the presence of trichinæ gives rise to very pronounced disease symptoms; and they are often a direct cause of death. A



FIG. 424. Trichinæ. a, male, b, female intestinal trichina; c, muscle trichina.



FIG. 425. Part of a muscle with encapsulated trichinæ.

few days after having eaten the infected pork, the patient generally complains of severe gastric and intestinal disturbances, such as nausea, vomiting, colicky pains, and usually diarrhea. Later a persistent constipation may set in. These symptoms are all due to the ravaging of the parasites in the intestinal tract, and are followed later by manifestations indicating the fact that the worms have penetrated the intestinal wall and begun their progress in the muscles. Gradually increasing pain, weariness, and stiffness are the chief early symptoms connected with their encapsulation in the muscles; and these are later followed by various other manifestations, depending upon in which muscles the parasites have mainly lodged. Skin eruptions, profuse sweating, boils, soreness in the throat, and insomnia are among the later symptoms.

The treatment is entirely prophylactic, consisting in a thorough inspection of all meats, and in a strict prohibition against eating raw pork. Thanks to the more and more rigid enforcement of these rules in most civilized countries, the disease is now comparatively rare. Once the parasite has gained access to the human body, the physician is able to do little but alleviate the pain and other unpleasant symptoms, by giving warm baths, compresses, and internal remedies. It may sometimes be possible, if the trichinæ are discovered while yet in the intestinal canal, to prevent their invasion of the muscles by strong purges and tænicides.

TRIONAL.—A substance which is almost identical with sulfonal. It occurs in colorless, tabular crystals, having a slightly bitter taste. Trional is used like sulfonal to produce sleep, but acts very much more rapidly than the latter drug, usually taking effect in less than half an hour. A few doses are generally quite safe; but its continued use is dangerous, and may lead to the same symptoms and results as chronic sulfonal-poisoning. It is given in ten to thirty grain doses, and is best administered in some hot drink.

TROPICAL DISEASES.—The various diseases of mankind are not evenly distributed throughout the various quarters of the globe, and those diseases which are more prevalent or are peculiar to the warm climates claim special attention. In the realm of infectious diseases it is a striking fact that the tropical countries are particularly rich in many forms. This is an observation which, by analogy, would probably be true apriorily, for in the tropics there is to be found a great richness of all forms of both animal and plant life. As one travels toward the poles it is well known that whereas the numbers of individual species increase, the varieties of forms diminish, and this general biological fact has its correlation in the field of disease, particularly where parasitic animal and vegetable forms are the exciting causes.

It is further well known that the tropical regions afford better developing places for certain forms of parasites which are known to be able to live and cause disease also in temperate climes, and this is true of the majority of pathogenic organisms. For this reason the ordinary diseases of the temperate climes are very widely distributed in the tropics as well; in fact, most of them are universal. Tuberculosis, measles, scarlet fever, diphtheria, pneumonia, typhoid fever, smallpox, whooping-cough, tetanus, syphilis, gonorrhea—these are found everywhere. They depend for their distribution on the migrations of man, and wherever he can live these parasites live with and upon him. There are, however, two important ideas to be borne in mind. In the first place, there are some more or less universal disease-producers which attain an undue prominence in tropical countries, *i. e.*, are very widely and fatally prominent; and secondly, there are some forms of disease which are practically limited to the tropics. These constitute a minor part of the general aggregate, but are entitled to special consideration.

Just as in the temperate zones it is found that scarlet fever, typhus, and acute articular rheumatism are very common, while they are rarely observed in the tropics, so there are diseases more limited to the tropics, such as yellow fever, pernicious malaria, cholera, etc., and some others which are exclusive to these regions, trypanosomiasis and a few intestinal parasitic diseases.

Since the tissues of the human body are the special food-supply of these various infectious disease-parasites, it may be asked why it is that certain diseases can be limited to the tropics, for the human body of negro or of esquimo varies little in its composition. The general law of biological distribution helps to meet the question, since there are certain climatic conditions which affect the parasites very materially, much as the climatic conditions affect the growth of tropical exotic plants or animals of higher organization than the plants and animals causing disease. It thus comes about that there are a few non-transportable tropical diseases, as well as a host of transportable ones.

The diseases of the tropics, or those more particularly characteristic of these regions, may be divided into five different series:

(1) Those due to known minute parasites, or general infectious diseases: Malaria, yellow fever, plague, dengue, Mediterranean fever, Indian Nasha fever, beriberi, climatic buboes, leprosy, yaws, verrugas of Peru, and the Potos.

(2) Diseases due to poisons: Pellagra, atropicism, lathyrism, kubisagari; also poisoning by lacquer, and by poisonous snakes, or other venomous creatures.

(3) Diseases due to animal parasites: Dystomas of various kinds, Bilharzia, Medina-worm, filaria, anchylostoma, and rarer parasites, including forms of tapeworm and of fleas (chiggers, etc.).

(4) Organic diseases: Tropical sprew, tropical dysentery, kala azar, tropical liver affections, lata disease, sleeping-sickness.

(5) Cutaneous diseases: Prickly heat, kro kro, tinea umbricata, pinta, Oriental sores, tropical sloughing diseases, ainhum, Medina foot, etc.

This is the classification by Scheube. It is an arrangement which follows no definite plan save that of general convenience. Thus, malaria and sleeping-sickness are caused by closely related animal blood-parasites, and from one point of view should be classed together. In this place only the more general features of tropical diseases can be discussed, many of the forms enumerated having been treated under their respective headings.

The Malaria of the Tropics is of special significance. It is known that there is more than one kind of malaria; in fact two or three different blood-parasites causing this disease have been described. These parasites are conveyed to man by the bites of certain kinds of mosquitoes, namely, members of a definite genus (*Anopheles*), of which some eighty or more species are known. Only a small number of these, however, are known to

be malaria carriers. The disease does not originate in the mosquito; it must come from some infected human being. As Manson has well put it: "Let us imagine some primitive native community, a village in some district where anopheles mosquitoes abound, any small native village of Africa or the Philippines or in South or Central America. Let it be supposed that this village is free from malaria. A stranger with malarial parasites enters this village. The local anopheles bite him and become infected and infective. In a very short time every individual in the village gets malaria. Most recover, but some die. The survivors gradually become immune after many years and many inoculations. Children are born, however, and so the disease goes on, the older inhabitants immune, but the disease kept going through the medium of the children. This is the actual condition of every village in a malarious district." The great lesson to be learned is that a native village should be shunned, especially if it is in a district where the anopheles abound. This is particularly true at certain times of the day, notably at dusk, at night, and in the early morning hours, for at these times the mosquitoes feed.

The early morning hours are not unhealthy because they are early morning hours, but because the mosquito is abroad then. A railroad crossing is dangerous only when there is a train passing. The adult native from a malarial district will make a safe guide and companion in the tropics, for he will not have malarial parasites; but the youth, or the adult from a previously healthy neighborhood is not as safe a companion to choose because of his liability to become infected. The essential thing to do in a malarial district is to prevent the mosquitoes from becoming infected by biting malarial patients, and the disease can not spread. Every malarial patient should be actively treated with quinin and kept in a mosquito-proof room.

The malarial parasite may live in the human body at least a year, or in some cases, two. After this it is apt to die out unless a re-infection takes place. In the tropics malaria exists in its most virulent form. It is called by a vast variety of names: Swamp fever, marsh fever, paludal fever, jungle fever, hill fever, coast fever, mountain fever, gnat fever; and also by local names in abundance: Daar, Batavia, Kamerun, Panama fever, etc. It is the most common of all the tropical fevers, and most people who live in the tropics sooner or later acquire malarial fever. It is not, however, the only tropical fever by any means. Other chronic fevers may be due to the Mediterranean fever, liver abscess, elephantiasis, trypanosomiasis, kala azar, relapsing fever, or even leprosy. Three important features are concerned in the diagnosis: Periodicity, microscopical appearance of parasites in the blood, and the reaction to quinin. Any fever recurring every forty-eight or seventy-two hours is usually malarial, although mistakes in diagnosis are very frequent in the presence of seventy-two hour periodicity of

the fever. It may be an abscess and a sign of pus instead of malaria. For the special symptoms of **MALARIA** consult the article under that heading.

Yellow Fever is an epidemic tropical disease of unknown causation, although it is not improbable that it is due to some form of minute animal, and communicated and spread also by means of a mosquito host. The life history of yellow fever has not yet been thoroughly worked out, but it seems fairly definitely proved that it is conveyed by a mosquito of the genus *Stegomyia* (*S. fasciata*). The old-fashioned methods of disinfection for yellow fever are therefore inadmissible; and the chief concern of the hygienists of the future in their attempts to diminish the spread of this disease will be to kill the *Stegomyia* and also to limit the infection of this or other conveying animal hosts by carefully screening off the patients. The chief symptoms of yellow fever are considered under the alphabetical arrangement.

The Plague is an endemic disease in certain countries, particularly in India, from certain places of which it spreads and becomes universal. Some of the great scourges of history were caused by bubonic plague. Its chief features have been discussed under **PLAGUE**, and need not be repeated here.

Two comparatively new tropical diseases have in recent years been the subject of much careful investigation. These are trypanosomiasis, or the sleeping-sickness, and kala azar. Although both have been known from the clinical standpoint for many years, it has been only since 1900 that the determining causes have been discovered.

Sleeping-Sickness is an African disease of a very dramatic character: deadly and weird in its course, and made even more fascinating by the romantic literary handling that has been accorded it. It is very prevalent among the native races, and in certain places it is known to depopulate whole villages. It has been contracted by whites, in whom it runs a slightly different course. In the negro it starts with headache and a low fever. There is a very characteristic lassitude, the patient being tired and sleepy, and sitting about with a dejected, vacant countenance, with drooping of the lower lip. This persists for a month to six weeks, the lassitude deepening into a marked lethargy; and in the second month the facial expression becomes even more listless, the upper eyelids droop, the face becomes puffy, and the patient seems half dead. At the end of three months the patient is in a much reduced condition, saliva drops from the lips, and there is a very evident dementia. The body becomes dirty, the arms are subject to a jerky tremor, there may be spasms in other muscles, and the patient becomes so stupid that he is unable to move about. During the fifth to sixth month he loses ground rapidly. Sores appear; the lymphatic glands, particularly those of the cervical region, become swollen; itching may be extreme; convulsions may occur; the patient can no longer speak on account of paresis of the muscles and loss of intelligence; and in from six to seven months

death takes place by exhaustion, by epileptiform convulsions, or by some intercurrent affection (tuberculosis, pneumonia, etc.). The more rapidly fatal cases terminate in death in three to four months; other patients live two to three years and pass through a series of changes very highly suggestive or general paresis. See BRAIN, SOFTENING OF.

The changes in the brain are those of a diffuse meningo-encephalitis with marked infiltration around the blood-vessels. The cause is a minute blood-parasite (*Trypanosoma*), which belongs to a group of well-known microscopic animal forms, the *Protozoa*. Since the opening up of Africa, the disease has spread from its original home in western Africa from Senegambia to Benguela, and has extended into the upper part of the Nile Valley; and it threatens to become very wide-spread. As it has been a uniformly fatal disease, and its ravages have been very marked, killing 40,000 natives in Uganda alone in one year, its limitation is highly desirable. There is no recognized form of treatment, although Ehrlich has devised a trypan red which has some promise either in its original or modified forms. Related parasites are present in Texas cattle, causing the well-known Texas cattle-fever, and thus it becomes of importance to bear in mind this parasite. Furthermore, the "surra" of the Philippines and the "mal de Caderas" of South America are both due to a trypanosome. As it is the case with our Texas cattle-fever that a fly, the tsetse fly, is the agent of transmission, so it has been assumed that the *Glossina palpalis*, one of these flies, plays the same part for human trypanosomiasis. It is a very common fly of Africa, inhabiting the banks of lakes and streams, and is a fierce biter. Its habitat probably explains the observations of several travelers in Africa, that those whose occupations lead them to a life in the neighborhood of streams (fishermen, boatmen, water carriers, etc.) are much more liable to infection. Whole tribes who live on the borders of lakes have died of the disease, while agricultural communities inland have not suffered. A careful study of the wild tribes of South America may show somewhat similar conditions.

Kala Azar, or febrile tropical splenomegaly, is a disease which begins like a malarial fever; and most of the patients say they have malaria. Chills, fever, and sweating are common accompaniments. This is followed by a dormant period, then a renewal of the symptoms, then again a dormant period, and so on. This may go on for several months. The spleen and the liver commence to enlarge, the former often getting enormous. There is marked anemia, languor, fatigue, and difficulty of breathing. The abdomen swells, emaciation becomes marked, the skin is sallow and dirty, and the patient becomes bedridden and usually dies in a few years. These cases have been grouped with the chronic malarial cachexias, which they resemble closely in their clinical picture. In spite of active medication by both quinin and arsenic, these patients become progressively worse, and

all die. This disease has been epidemic in India, going from village to village at a rate of five miles a year or more, and has entirely depopulated certain parts of Assam. Just what the cause is, is still a matter of some doubt in the minds of the ablest pathologists, but Leishmann has described a blood-parasite found in those suffering from this disease, which has been assumed to be the cause. It is a trypanosome similar to that found in sleeping-sickness, and at times resembling, in certain stages, the micro-parasite of malaria. This disease is now known to occur in India, in the Egyptian Sudan and Algiers, and in China; it was communicated to soldiers of the German army during the Peking campaign, and has also been observed in other Europeans. It is not at all unlikely that it may be found in some American tropical countries. Manson believes that the parasite probably leaves the body in ulcerated surfaces which are very common in the disease, and may be conveyed by the bite of a flesh-eating fly. He further suggests the relation of kala azar to the so-called "Oriental sore," or "Bagdad boil."

The Mediterranean Fever, also called rock-fever, Malta, Levant, and Neapolitan fever, is a fever of bacterial origin, prevailing in the Mediterranean region and not unknown in America. It is known to occur also in India and in China, and has been found in Porto Rico and the Philippines. It is thought to be due to a *Bacillus melitense*. The disturbance arises in from ten to thirty days after infection, with gradual malaise, constipation, headache, loss of appetite, perspiration, etc. This lasts a few weeks, whereupon the patient passes into a long period of dull fever. He becomes apathetic and heavy. There is no delirium, but a marked anemia develops. There is an alternating febrile and afebrile course, which may go on for some months or even for a year or two. The patients usually recover.

Dengue, or break-bone fever, has already been described in its alphabetical place, as have also BUBO and LEPROSY.

Framboesia, or the Yaws, is a name given to a wide-spread tropical disease which is chronic and contagious, and associated with diffuse granular, wart-like eruptions on the skin. It occurs in South and Central America, and in the Antilles, and is distributed throughout tropical Africa and Asia and the Pacific Islands. At one time, especially during the height of activity of the slave-trade, it was common in Cuba and in certain ports of the southern states. It has practically disappeared from the United States. The disease attacks all races, although the black and yellow races are more susceptible than the white. The cause is not yet known with definiteness. It is usually conveyed by direct inoculation, which is largely accidental, although it was at one time the custom to inoculate children under the wrong supposition that they had to have it anyhow.

The eruption breaks out after an incubation period of about two to three weeks, during which time there may be symptoms of general discomfort,

headache, and rheumatic pains. This period is soon followed by the development of the primary sore, which is a small papula developing into a shallow ulcer. In about a week this is followed by a thickened scar. A period of quiescence is then observed, lasting several weeks, which is followed by a general eruption scattered over the entire body. The face, neck, genitals, and trunk are the common sites of this eruption. The scalp and armpits are not often implicated. The mucous fringes of the mouth, sexual organs, and anus are most frequently attacked. The eruption is at first very fine and papular, like a pin-head, but this enlarges until it becomes the size of a pea or hazel-nut, whereupon the eruption spreads. The papulæ become purulent, and the skin cracks and tears and leaves a reddish, warty, raspberry-like mass (*framboise* meaning raspberry). This, when active, exudes a thick, creamy pus, and the area is intensely itchy, although not painful. The resemblance to a certain form of syphilitic eruption is very marked, and some observers have suggested the similarity of origin of the two. After several weeks or months the papulæ, after appearing in crops, dry up, and small scars are left, white in the negro and pigmented in the white. Practically all the patients recover, and thenceforth are immune to a second attack. Iodid of potash is the best remedy for frambœsia. Care should also be taken to avoid contagion by paying attention to all cuts and abrasions, and by the avoidance of infected localities and dwellings.

Verugas Peruviana, or Peruvian warts, is a tropical disease which is more or less limited to the Pacific slope of the Andes, particularly in Peru, Chile, Bolivia, and Ecuador. It seems not to be found in the lower-lying countries, persisting only at an altitude of at least 3,000 feet above sea level. The soldiers of Pizarro's army in the sixteenth century contracted the disease from the natives, but it did not obtain any foothold in Europe. It is not an actively contagious disease, although small epidemics have been described. It is infectious, and can be directly inoculated. Moreover, it is found in fowls. The disease has been thought to be a form of yaws, and also a manifestation of syphilis, but both of these beliefs are untenable at the present time. Its exact cause is unknown, and it is in need of more exact methods of investigation. Like yaws and syphilis there is a short incubation period (ten days), or in rarer cases much longer; twenty-three days is the record of voluntary experimental inoculation of a medical student who subsequently died of the infection.

The signs of the initial period are lassitude, general depression, and leg-weariness. A fever then develops, at first in the evenings only, later becoming more violent. Chills and a marked intermittent character of the fever then commence, and violent joint-pains begin. These pains pass from joint to joint and are more violent at night. Muscle-pains and contractures take place, and anemia and emaciation occur. The skin becomes yellow and pale, the liver and spleen enlarge, and the patient is very ill. In about

twenty days a general eruption develops, when all the symptoms subside somewhat. This breaking out is first in the form of small pinkish papulæ, which become dark blue in color, and finally become wart-like. The face, particularly about the eyelids and nose, and the skin about the joints are the chief sites of the eruption. The warts may be very small, or they may be one to two inches in diameter, and they may be few or many hundreds in number. In some patients they are found on the mucous membranes; and as they bleed easily they may cause serious anemia. After four to six months, if the patient stands the strain, the eruptions subside, either drying up or ulcerating, leaving flat scars behind. The disease is usually fatal, especially in whites, sixty to seventy per cent. dying. The mortality of the native population is from ten to twenty per cent. The treatment is purely that of the symptoms. Quinin and hot drinks, descent to a lower altitude, and careful feeding are advisable.

Kubisagari is another disease concerning which very little is known. It is not strictly a tropical disease, but is found in northern Japan, and has some relations to a peculiar disease described by Gerlier as occurring in natives in the mountains of Switzerland, who live in their chalets with their farm animals closely around them. It is not unlikely that the disease has some relation to the family periodic palsies. It attacks all sexes, principally in the warm months, and is a very chronic disorder. Kubisagari manifests itself in the form of attacks which come on at intervals of a few hours to several days, and persist for a few moments to several hours. Either hunger, fatigue, or sudden excitement may be the starting-point of an attack. Suddenly there develops a marked dimness of vision, the patient sees double, and there is paralysis of the eyelids. Also other muscles may suffer signs of weakness. The head often can not be held erect, but drops forward, this particular attitude having given the name to the disease. Swallowing may be rendered difficult, and even walking made impossible. Between these attacks the patient seems perfectly normal, save at times for the persistence of the paralysis of the eyelids and the weakness in the muscles of the neck. Most of the patients get well.

Atriplicism is a rare form of poisoning by a species of *Atriplex*, a common weed of China, used as a salad. Within ten to twenty hours after eating the weed, there is noted a tingling of the fingers and back of the hand, which is soon followed by a swelling in the hand itself and an itching which spreads up the forearm to the elbow. The face may later be involved in the same manner. The itching and swelling continue from two to ten days; and after the superficial layers of the skin are exfoliated, healing takes place, interrupted in some by the formation of blebs or ulcers. Local sedatives give good results.

Lacquer-Poisoning is a form of poisoning common to Japan, where the exudation of a species of *Rhus* is widely used in the manufacture of the

black lacquer so much employed in all Japanese work. It resembles the poisoning due to other species of *Rhus* (poison-ivy, poison-oak), which are so well known in this country, save that it is much more severe. Local sedative applications are employed in the treatment. The ginkgo-tree, so widely introduced from Japan for use in our public parks for the past ten or fifteen years, is said to cause a similar form of poisoning. No authentic cases are on record, however, and an active handling of the leaves and fruit has not caused any poisoning. (S. E. J.)

Lathyrism, or chick-pea poisoning, is a common form of poisoning of cattle, although not so common with man. The disease is present in tropical countries where certain species of vetch abound, notably in Italy, France, Algiers, and British India. It is known also in the southern United States and South America. The seeds, like small peas, are often used as a food or as an addition to food in times of shortage; and when eaten for some time (several months) give rise to serious, even fatal poisoning. Fever, dyspepsia, and intestinal symptoms usually precede the more severe signs of pain in the loins, legs and knees, with weakness, and tremors. Then a stiff, paralytic condition accompanied by spasms develops in the legs; the knee-jerks are exaggerated, and there may be some disturbances of the bowels. The disease may involve the bladder, though less often. Permanent paralysis may remain. The spinal cord usually shows signs of degeneration. The treatment is by withdrawal of the seeds; otherwise purely symptomatic. The best treatment is by education. The public should recognize the dangers that may arise from eating these seeds.

For the treatment of bites by poisonous snakes see the article SNAKE-BITES.

Tapeworms and various other intestinal parasites are extremely common in all tropical countries. The filthy habits of the natives and the lack of sewage systems render it impossible to cope with these diseases. The methods of prevention are described in the articles on PARASITES; TAPE-WORM; WORMS.

Sprew or Psilosis is a wide-spread tropical disease of very grave import, and should not be confounded with what is termed aphthæ or sprew of children. It is present throughout the entire tropical world, and has received various names, such as white diarrhea, Ceylon sore mouth, the "white flux," etc. It seems to be a general catarrhal process of the intestinal canal, associated with a number of infectious organisms which fasten themselves upon the devitalized body. A form of *Amebæ* is very widely present in these cases. Intestinal parasites are also very common accompaniments, uncinariæ being one of the most important. It should be borne in mind that soldiers or citizens who have been in the Philippines for any length of time may develop the disease, which may lie dormant for a number of years after the return of the colonist to his home. The disease is very chronic,

usually persisting a year or two, or even longer, the patient becoming thin and pale, and his complexion muddy and sallow. Nervous irritation with lassitude and weakness is pronounced; and sore mouth, diarrhea, and excessive development of gas in the intestines may be present.

The mouth always shows very characteristic features. The tongue is usually clean and small, although somewhat yellowish. Along the back and edges of the tongue, particularly along the root of the tongue, small, fine ulcers covered with white pellicles are very prominent. These may run into one another, and by ulceration form peculiar running sores. In patients who have been sick for some time, the fissures may become very deep, and the tongue takes on a glossy and varnished appearance. The taking of salt or very highly seasoned food brings on pain, and swallowing also causes sharp, shooting pains, showing that the disease is in the esophagus as well. The diarrhea is very constant, one or two movements a day or even as many as eight or ten being present. These pass in a liquid or semi-liquid condition, usually without pain, and are white and of a peculiar odor. The reaction of the stools is acid, and they have been compared to whitewash. Marked anemia develops, and the patients often die of inanition. The treatment is by means of an absolute milk diet, local applications to the mouth, reconstitutives (such as iron and arsenic), and the taking of fresh fruit, particularly lemon-juice, strawberries, and raspberries.

Tropical Dysentery is much more severe than the dysentery of the temperate climates, but presents no other features that have not already been discussed in the article on DYSENTERY.

Tropical Buboës is a disease characterized by subacute inflammation of the lymphatic glands of the groin. It is usually attended by fever which persists three to four weeks and is of the remittent type. It is found in the Philippines, in the West Indies, in the Mediterranean region, and along the coasts of Africa and Asia. Soldiers and sailors are most often involved, and the disease is thought to be spread by the bites of insects. It is probably of bacteriological origin. The disease begins with a moderate tenderness and swelling of the glands in the groin, and the patient may have a chill, followed by fever, headache, and backache. The buboës slowly increase in size until they may become as large as hens' eggs. The fever abates, and the symptoms subside after one or two months. Many of the glands suppurate, and ulcers form with deep burrowing abscesses. After two or three months the disease subsides, and after a long and painful convalescence a cure is effected. Local treatment by iodides, iodine, and other skin stimulation gives the best results.

Lata is a peculiar manifestation of disease common in the tropics, particularly among the Malays. It is probably a hysterical manifestation, and is in need of further study. Certainly the lata as seen among the Javanese is purely hysteria, although not infrequently it may be complicated with certain forms of mental affection.

Amok is an affection seen among natives of various tropical lands. It has been thought to be a distinct disease, but is undoubtedly only a symptom of a number of insane states—*dementia præcox*, epilepsy, and other psychoses—in which there is clouding of consciousness.

Ainhum is a tropical disease of the dark races, distributed in Africa and India and Brazil, and having occurred also among the negroes in the United States. The disease usually commences as a narrow slit or groove caused by the splitting of the fissure beneath the toes. This gradually becomes so marked as to cut off the toe from the foot, until it finally separates from gangrene. It probably is not a definite disease, but a symptom of a number of conditions, perhaps leprosy, perhaps other forms of trophic disturbance.

Madura Foot, or the fungus-foot of India, is a disease common to India, but not unknown in South America and the southern states of North America. It is very closely allied to the condition known as actinomycosis, and most of the cases reported from the United States are probably this disease. It usually begins in one foot, commencing as a hard pimple on the sole, which gradually softens and discharges. A persistent sinus then is formed, and by the occurrence of other nodules and other sinuses a diffuse, thickened, inflammatory condition develops. This can only be treated by surgery, by the resection of the entire area, or by cutting off the foot.

Pinta and Tinea are forms of superficial skin-disease due to parasites related to those known in the temperate zones, although distinct from the latter. They are tropical forms of ringworm, and vary only by the greater severity of the affection. See RINGWORM.

Oriental Sores of various kinds are extremely common in the tropics. Most of them are instances of a streptococcus infection, and arise owing to the filthy habits of the natives. They frequently involve the face, leaving scars with depressed, irregular, rounded edges. They are best treated on ordinary antiseptic principles.

TROPICS.—Any one who journeys to tropical countries, no matter in what capacity, ought to remember that he is taking certain risks with regard to his health. The conditions which menace health in the tropics are, on the one hand, the climate, and, on the other hand, certain indigenous diseases, among which malaria ranks first. In order to reduce these dangers, only persons who are physically suited to live and work in a tropical climate ought to make the attempt. The age of the individuals is of great importance. They should be neither too young nor too old, the years between twenty-five and forty being the most suitable. Further, their health must be good, and they should, particularly, be neither anemic nor obese. They should be free from diseases of the lungs, heart, or kidneys, should not be heavy drinkers, and should not be predisposed to gastric or intestinal troubles, nor to rheumatism. Furthermore, a person having suffered from malaria, dysentery, or sunstroke, is unfit for service in the tropics.

Fortunately, the dangers which menace health in the tropics may be guarded against. They may be greatly diminished by following certain rules of hygiene, especially as regards proper clothing, nourishment, and drinking-water, and the proper mode of living.

Suitable clothing for the tropics is such as protects the body from the effects of heat and from the rays of the sun, at the same time furthering the evaporation of perspiration and the throwing off of heat. The underclothes should, preferably, be made from fine, smooth cotton tricot, or from cotton material with moderately large meshes; the coat and trousers (respectively the skirt and waist of women) should be thin and roomy, either in white or light colors; the head should be covered with a tropical helmet made from cork or pith; and as a protection against mosquitoes a light gauze veil should be worn around the neck. The shoes should reach above the ankles, for the ankle is a favorite spot for mosquitoes to bite. Canvas shoes, whitened with pipe-clay, or shoes made of soft kid, are preferable. All such articles of dress as tend to retard the exhalation of the skin (such as stiff shirts, collars, cuffs, corsets, etc.) should be discarded. The neck and wrists should be bare, and the sleeves of the underclothing should therefore be short. To prevent taking cold, it is advisable to have the body covered during the night. Pajamas consisting of wide pantaloons and jackets, and made of cotton, flannel, or silk, are generally used as night-dresses.

With reference to food, it must be borne in mind that the muscular activity of the average person is generally much diminished when he lives in the tropics. In consequence of this, his desire for food is also lessened. If he does not take this into consideration, but continues his customary way of living, and takes too much albuminous food, he will impair his health, and his liver especially will suffer. With an increasing amount of work, an increasing amount of nourishment is required, as at home. In the tropics, as in the summer time in temperate zones, there is less desire for carbohydrate and fatty foods; and there is, therefore, a greater consumption of vegetable food. The appetite, which is affected by the heat, should be stimulated by a suitable and varied diet; and the body should be given the necessary nourishment in the most appetizing and digestible form. It is best, in a country where no cattle is raised and where northern vegetables are not cultivated, to follow more or less the customs of the natives. Preserved foods should be eaten but sparingly, for they neither taste good nor benefit the body. Since heat reduces the activity of the intestine, there is great need of spices in the preparation of food in the tropics. Excessive eating of condiments, however, should be avoided. Nature provides an abundant and varied supply of fruits in tropical countries, and these are strongly to be recommended. Moderation, however, is to be the watchword in this as in other cases, for excess may readily cause digestive disturbances and intestinal diseases.

Pure drinking-water is of great importance. When good water can not be procured, one should make the available supply fit to drink by boiling it for from 15 minutes to half an hour, in order to kill micro-organisms which may be present, and which otherwise might cause abdominal typhoid, dysentery, or other diseases. Charcoal filters, and other similar devices, are not reliable; for in order to give good results they must be cleansed frequently, and this is difficult to do. If the natural supply of water is unfit for use, it is advisable to drink mineral waters, tea, or coffee instead. Alcoholic beverages should be abstained from, for experience has taught that alcohol undermines the health more radically and quickly in tropical countries than in higher latitudes.

The mode of living should be regular in every respect, and all excess should be avoided. As for physical exercise, it may be said that too little is as harmful as too much. Although the white man can not possibly perform any severe manual labor (such as, for instance, farming entails) in a tropical country, abundant physical exercise is necessary for the general bodily welfare. Gymnastic exercises, all kinds of sport, riding, bicycling, rowing, bowling, lawn-tennis, football, etc., are all suitable and recommendable occupations for the cool evenings.

Cleanliness and care of the skin by means of frequent baths are very important in warm climates for the preservation of health. Daily bathing is generally indulged in mornings and evenings, before breakfast and before supper. See also **MALARIA; PRICKLY HEAT; TROPICAL DISEASES.**

TUBERCULOSIS OF THE LUNGS (CONSUMPTION).—With its conception of “pulmonary tuberculosis,” public opinion generally associates the idea that in this disease the affected organ, the lung, gradually wastes away and finally breaks up. This assumption is true only in some cases of the disease. Under the name “pulmonary tuberculosis” are included only those affections of the lungs which are brought about by the action of the tubercle-bacillus. This infinitely small micro-organism was demonstrated by Robert Koch, in 1882, to be the cause of tuberculosis. It can be seen only when magnified many hundred times under the microscope (see Fig. 62).

As a result of infection by the tubercle-bacillus, a great many changes may take place in the lung. These changes will vary according to the number of these organisms that enter the lung, according to the avenue of infection, according to the age and constitution of the patient, and according to other, partly unknown, conditions on the part of the body and of the bacillus. Only the more important forms of the disease can be considered here.

Pulmonary tuberculosis is a pronouncedly infectious disease. Every case must be preceded by the entrance of the tubercle-bacillus. The conditions, however, are not such that every invasion of disease-germs is bound to be at once followed by an outbreak of tuberculosis. The healthy human

body is fortunately able, as a rule, by aid of its natural resistance, to withstand the action of the bacillus. Not until the body has lost this natural bulwark,—either as a result of some severe general disease, or by reason of an excessive loss of blood or body fluids, or, principally, by harmful influences constantly affecting the lung—are the tubercle-bacilli able to gain a foothold and develop without hindrance.

The subject of the heredity of consumption requires some consideration. It has been scientifically demonstrated in an exceedingly small number of cases only, that children have been born affected with tuberculosis. As a rule consumption is, even during the first weeks of life, the result of an infection from tuberculous members of the family. That which in reality may be directly transmitted from parent to child is a general constitutional weakness, a decreased power of resistance, the nature of which is not well understood. This tendency or predisposition of one person to succumb to morbid influences more readily than does the average person—to be almost defenseless, especially against the action of the tubercle-bacillus—manifests itself, even in early childhood, by a series of changes known as scrofulous. Later in life, the so-called “consumptive habit” of the body may be present. This is shown by a rank growth of the body, a lank and lean figure, flattened chest, stooping posture, protruding cheek-bones, prominent shoulder-blades, hanging shoulders which are moved slightly forward, and a pale and sallow complexion (see Plate XVII., Fig. 2).

The chief avenue of entrance of the infection is by the inhaled air. The bacillus is contained in the sputum or some other secretion of a tuberculous patient; and when this secretion is allowed to dry, the bacilli are set free, are mixed with the dust, and inhaled with the air. The extremely fine vapor which, on coughing or hawking, is emitted to a distance of a yard or more, remaining suspended in the air for some time, may likewise contain tubercle-bacilli which may transmit infection by inhalation. Direct infection is possible also through kissing tuberculous persons, or even through the medium of their hands, which may be soiled by wiping and drying their lips. Danger of infection may follow the ingestion of the products of tuberculous animals. Milk, especially, has been found to contain tubercle-bacilli, even though the cow did not suffer from tuberculosis of the udder, but from a tuberculous affection of some internal organ.

Among the causes which weaken the body, or impair the respiratory organs, thus preparing the soil for the colonization of tubercle-bacilli, the following are the most important: Deficient nourishment, unfavorable conditions of dwellings, too early resumption of work after severe diseases, alcoholism, injurious attitude of the body when working, and constant inhalation of irritating dust. In women, frequent confinements are an additional factor. It is also of importance to remember that tuberculosis often follows measles, whooping-cough, and pneumonia.

Tuberculosis claims more victims than any other disease. It spares no class, no age, and no sex. Although some districts are less visited by the malady than others, the disease is met with even in climates that are naturally favorable. It is generally assumed that about one-seventh of all deaths is due to tuberculosis, but this figure by no means expresses the frequency of the disease. About 1,250,000 individuals die every year in Europe as the victims of this scourge; and in 1900 more people in the United States died of the "White Plague" than of any other single disease.

On comparing the number of cases of death due to tuberculosis with the total mortality at different ages, it will be found that the greatest number of victims succumb between the twentieth and the thirtieth year; hence, while in the prime of life. Industrial communities are very prone to suffer from tuberculosis; agricultural communities less so, though these are not exempt.

The course of tuberculosis presents a great variety of forms. Whereas in some persons the disease terminates fatally within a few months, even in a few weeks, in other patients it remains stationary for years, or progresses very slowly.

Acute miliary tuberculosis, an especially acute form of consumption, occupies a unique position. In this form of tuberculosis, numerous tubercles, of about the size of millet-seeds, form in a very short time—not only in the lung, but in other organs of the body as well. Their origin can be explained on the hypothesis that a bacillus-containing area, situated in some part of the body, softens and breaks down, whereupon the circulating blood carries with it numerous tubercle-bacilli which flood the body. It is a type of infection resembling acute pyemia, the only difference being the infecting agent. This form of pulmonary tuberculosis is difficult to recognize, particularly at the onset, as the symptoms of the disease vary greatly, often being of a general, uncertain nature. In some cases the disturbances are general; in other cases they are localized, either in the lung (cough, stitches in the side, shortness of breath), or in the brain (headache, fever, stiffness of the neck and back, etc.). When the disturbances affect the general health, the condition is sometimes confused with typhoid fever; but gradually the characteristic pulmonary or cerebral symptoms become manifest, rendering diagnosis certain. There is no hope of recovery from acute miliary tuberculosis, even if the disease be recognized at the very onset. The efforts of the physician, as well as of the patient's friends, can be directed only toward affording the sufferer some relief from the more distressing symptoms. Death generally takes place in three to four weeks.

The course of chronic pulmonary tuberculosis likewise shows great variations with reference to the changes taking place in the lungs, as well as with regard to subsequent affections and to the severity and duration of the disease as a whole. In the large majority of cases, the onset of chronic

consumption is an extremely insidious one. The patient is at first thought to be suffering from an apparently harmless attack of anemia, a persistent catarrh of the stomach, or from a slight bronchial catarrh, until at last a medical examination of the lungs and of the sputum reveals the true nature of the malady.

The first striking symptoms pointing to an affection of the respiratory passages, are cough, expectoration, and pain in the chest. The pain is usually situated in the region between the shoulder-blades, or in the sides, and is caused by an inflammation of the pleura. It is possible that pain of a similar nature may be due also to disturbances of the diaphragm and of the chest-muscles, which are strained by coughing. Pulmonary tuberculosis, however, may be present for some time without causing pain, even if extensive destruction may have taken place in the lung. Cough, which is one of the most tormenting symptoms of the disease, often becomes worse at night or just on arising in the morning. Expectoration may be entirely absent at the onset of the disease, or, if present, it may consist of mucus only. Later it may become a mixture of mucus, pus, and epithelium. When cavities have commenced to form in the lungs, the sputum becomes more intermixed with pus; and its original white or whitish-gray color takes on a yellow or yellowish-green tinge.

The patients are most violently agitated by the appearance of blood in the sputum. Slight, streak-like admixtures of blood frequently occur in the sputum of tuberculous patients without being of any dangerous significance. They should not be overlooked, however, as they may be the precursors of a hemorrhage. Profuse hemorrhages may persist for weeks or months, but are rarely an immediate cause of death. It sometimes happens that a hemorrhage from the lungs takes place without any demonstrable external cause. This is due to the progress of a destructive process which gradually opens blood-vessels in the lung. In some patients hemorrhage may be ascribed to excessive bodily exertions, violent straining during defecation, severe attacks of cough, and, occasionally, to mental emotions.

Respiration, in the moderately advanced cases, is usually not much impaired during rest. By breathing deeper and more frequently, the patient compensates for the quantity of oxygen lost by destruction of the affected portions of the lungs; and, moreover, he gradually becomes accustomed to the disturbances so long as they are not too violent. On bodily exertion, however, changes in respiration are frequent; and toward the end of life difficulty in breathing is one of the most distressing symptoms of the disease.

The color of the patient's skin is usually pale; and if extensive changes have taken place in the lungs, it has a bluish tinge. If fever be present, the face—often only a part of the cheeks—becomes markedly flushed. In many cases bright or brownish-yellow glistening spots develop on the forehead and on the upper parts of the cheeks; in other cases such spots appear

on the chest, back, and abdomen. The tendency to profuse perspiration is very marked, being brought on even by slight bodily exertion or mental excitement. Night-sweats, which most frequently occur about midnight or during the early morning hours, are particularly annoying, and require treatment.

Only few cases of pulmonary tuberculosis run their course entirely without fever. Moderate fever is present even during periods of comparative well-being. In the morning and during the day the temperature may be normal, but toward evening it usually rises to 100° or 101° F. (so-called *hectic fever*). High fever, especially in the evening, occurs in acute tuberculosis. The fever is due to the presence of secondary pyogenic infections. These are also the most prominent causes of chilliness, heat, perspiration, and headache. The course of the fever furnishes an essential criterion by which the physician may judge of the course of the disease.

The progress of consumption is marked by a gradual loss of strength, and by constantly increasing emaciation. This progressive emaciation affects the adipose tissue as well as the muscular tissue. The skin may become so emaciated as to be almost as thin as paper when raised in folds; and toward the end of the disease the various bones of the body become so distinctly visible under the skin that it appears as if nothing but the skeleton was left. During periods which are free from fever, the weight of the body may increase considerably, especially by the accumulation of fat. A contrast to the often extensive changes in the lungs, is seen in the mental alertness, liveliness, and hopefulness of the patients, which are often preserved until the end.

The complicating diseases of pulmonary tuberculosis are quite manifold. The pleura often becomes affected, either by a dry or by a moist inflammation. Tuberculous infection of the throat may develop, causing pain on swallowing, hoarseness, and even loss of voice. Involvement of the intestine may cause refractory diarrhea. Although tuberculous changes in the wall of the stomach are very rare, disturbances of digestion are by no means uncommon. The appetite is often impaired, even in the beginning of the disease; and the patient often shows aversion toward the most important foodstuffs, such as meat, eggs, and milk, even when no fever is present.

To establish a diagnosis of pulmonary tuberculosis, requires not only an exhaustive and careful examination of the patient's lungs and of the sputum, but of the entire body as well. If tubercle-bacilli be found in the sputum, tuberculosis is unquestionably present; but, on the other hand, this disease must not at once be excluded, even when repeated examinations have failed to demonstrate the presence of bacilli. A very material aid in establishing a diagnosis is afforded by the use of the *tuberculin test*, which consists in injecting very small quantities of Koch's tuberculin under the patient's skin. If the patient shows a reaction to the tuberculin—that is, if he manifests a peculiar rise of the body temperature, and disturbances of the general

health—it may almost with certainty be assumed that tuberculous changes are present. In most cases, however, the physician may arrive at a decision without resorting to this test; namely, by a careful examination of the lungs, and by a simultaneous consideration of the symptoms present. In some cases, however, this requires some time of observation.

The changes that take place in the lungs in the course of pulmonary tuberculosis, can not be described minutely in this place. Only those which it is necessary to know in order to get a general understanding of the disease will be mentioned.

The healthy lungs are spongy organs, made up of numerous air-containing vesicles (see p. 51). Under the action of the tubercle-bacilli, small areas of bronchitis or pneumonia develop. Then, in the struggle of the system to “eat up the bacilli,” as it were, small nodules (*tubercles*) appear. These, if present in large number, may become confluent and form hard masses; and these masses, on decomposing, form cheesy granules, particularly if the bacilli have been killed in the individual granule. The air-containing pulmonary vesicles are gradually encroached upon by the growth of these nodules, and by the resulting bronchitis and pneumonia, so that interference with respiration is brought about. In the further course of the affection, under the influence of pus-producing bacteria, a softening of the involved parts may take place. As soon as these softened masses perforate a branch of the bronchial tree, they are expectorated. This gradual softening and expectoration of lung-tissue cause the development of pulmonary cavities, which may be as large as a fist, or larger. It is quite obvious that the process of suppuration and disintegration involves the blood-vessels also. In many instances, however, the blood may coagulate in the affected part of the vessel before the wall of the blood-vessel has been perforated; and when this is the case no hemorrhage takes place. In other cases the hemorrhage may be very profuse.

As a rule, the tuberculous changes begin in the upper borders, or apexes, of the lungs—on one side, or on both. It is also usually the case that, in the further course of the disease, the upper parts of the lungs are more severely involved than the lower ones.

When the affection is slight, or when the focus of the disease is located more centrally, surrounded by healthy air-containing tissue, it is often impossible to discover the seat of the disease, either by auscultation (listening for the sounds produced in the lung), or by percussion (tapping) of the thoracic wall. With the increase of the inflammatory processes and of the consolidations, the respiratory sounds, as well as the sounds produced by tapping the chest-wall, are, however, materially changed, thus furnishing means of locating the diseased area. To correctly interpret the importance of these changes, in comparison with the sounds produced by healthy lungs, constitutes an art of the physician, to whom these methods of examination

(auscultation and percussion) constitute a means of obtaining a clear and certain picture of the nature and course of the disease.

The most important factor about tuberculosis is its prevention; and a consideration of those measures which are best calculated to prevent its development may be detailed to advantage.

The treatment of consumption is a matter for careful consideration by a physician. As has already been emphasized, the tubercle-bacillus is, as a rule, able to obtain a foothold only in a debilitated body, or in an organ which is injured. Therefore, by keeping the body in general good health, hardening it so that it can withstand external, harmful influences (see **HARDENING**), it is possible to prevent the appearance of tuberculosis. This care of the health should begin in early childhood, as the youthful body is characterized by its ready adaptability. The well-to-do, especially, often trespass in this respect by overindulgence and effeminacy; whereas the poorer part of the population does so from carelessness or from lack of knowledge, and, it is true, to a great extent also by reason of adverse economic conditions.

Marriage of tuberculous persons deserves special mention. In some communities the law has already advanced so far as to forbid consumptives to contract marriage. This prohibition is partly based on the assumption that the dissemination of tuberculosis is brought about by heredity,—if even only of the predisposition to the disease. Such a measure has great advantages. At any rate, tuberculous patients should consider it an imperative duty to forego marriage, at least so long as cough, night-sweats, general debility, or other symptoms which characterize active progression of the disease, are present. By marrying in spite of these disabilities, tuberculous persons, through their own fault, cause the misfortune of themselves and their progeny. Besides, they themselves are usually accorded only a brief space of life in which to enjoy matrimonial bliss; for the struggle for existence, and the worries caused by an increase of the household, cause an increased straining of all faculties, and further the development of this dangerous affection. In the case of the wife, the confinements are an additional, aggravating factor. Consumptives should not marry until the physician assures them that the disease has been arrested; and even then they should do so only under favorable financial conditions. It would be still more advisable to wait until two years after the disappearance of all symptoms of the disease, in order to be, to a certain extent, secured against recurrences.

Among the preventive measures against tuberculosis, the choice of a suitable vocation deserves the most far-reaching consideration. The choice of a suitable calling may often tend to procure complete health, or at least to prolong life for several years; whereas an unsuitable choice will soon kindle the lurking fire of the treacherous disease into a blazing flame.

prematurely ending the life of the affected. Individuals with weak chests, even though they be not predisposed to tuberculosis, are not fit for occupations in closed rooms, where they are exposed to irritating dust, gases, or vapors, or where they are called upon to handle poisonous materials. People with tuberculous tendencies should adopt an open-air life, particularly in the fields or woods.

To limit the dissemination of pulmonary tuberculosis, special attention must be paid to the sputum. In the first place, all persons affected with cough should be earnestly cautioned against expectorating carelessly on the floor or into a handkerchief. In the house a cuspidor should be used; outside, a wide-mouthed flask which may be carried in the pocket is advisable. No house should be without a cuspidor; and, better still, every room and every hall should be provided with one. The same holds good for all public buildings, factories, and shops, and also public conveyances. Hygienic spittoons are made of glass, glazed earthenware, or enameled tin, have wide openings, and should be partly filled with water or with an antiseptic solution. They must be emptied and cleansed with boiling water, at least once a day.

The authorities should exercise strict surveillance over dairies and dairy-farms, paying particular attention to the sanitary condition of the animals. Cows affected with inflammation of the udders should be segregated, and the milk of such animals should not be drunk. If tuberculosis of the udders be demonstrated, the affected animals should be killed and the owner indemnified. It may be recalled to mind that Robert Koch, the great German investigator of tuberculosis, upholds the opinion that tuberculosis of man and that of animals are of an entirely different nature. This fundamental question, however, has not been sufficiently elucidated as yet; and so long as investigators, on the basis of experiments, maintain that there is a relation between the two varieties of tuberculosis, it is advisable to continue the prevailing precautions with regard to the milk of tuberculous cows.

It should be the concern of public authorities to cause thorough disinfections in the dwellings of deceased consumptives; and inns, lodging-houses, railroad cars, ships' cabins, prison cells, etc., that have been occupied by tuberculous patients, should likewise be thoroughly disinfected.

When tuberculosis has made its appearance, or even if this disease is merely suspected of being present, a physician should be consulted without delay. His directions should be most minutely followed. Even the most insignificant suggestions which he may give with reference to nutrition and dress, to the regulation of work and recreation, to the enjoyment of fresh air, and to the hardening of the body, should be carefully heeded. Although as yet no absolutely sure remedy for this disease is known,—no remedy which will destroy the tubercle-bacillus in the human body without

detriment to the organism—yet that period is long since past when every consumptive is to be regarded as lost. In fact, the picture is quite the opposite; and the hope is now most emphatically held out that, taken in time, a great many patients can recover from tuberculosis. Daily experience of physicians at the autopsy-tables teaches that the lungs, even of persons who had lived under unfavorable hygienic and pecuniary conditions, may present changes which must be looked upon as unmistakable signs of their having recovered from pulmonary tuberculosis. Some pathologists of wide experience say that as high as 70 per cent. of people show recovery from



FIG. 426. Tent hospital for the treatment of consumptives.

some form of tuberculosis. Every experienced physician can point out a number of patients who have had well-developed tuberculosis, but who, nevertheless, by conscientiously having followed directions, have recovered or, at least, have improved so much that they are able to attend to their callings for many years, and may live to a ripe old age.

The standpoint of physicians with regard to the treatment of tuberculosis, is that the so-called physicommechanical remedies (water, light, dress, and regulation of diet, work, and recreation) are of primary importance. This is the view held for years. Nevertheless, one can not dispense with the numerous remedies which, as experience has taught, are capable of exerting a favorable influence upon the distressing symptoms; and which, by allaying the latter, facilitate the healing of the diseased areas. In addition to these expedients, a number of remedies for tuberculosis are constantly being

placed on the market. Some of these are introduced on the basis of serious investigation by scientific experts; others are marketed by unscrupulous speculators who, for selfish motives, advertise as "specifics for tuberculosis" remedies which may or may not have proved beneficial in a few isolated cases. All these considerations make it appear not only improper, but dangerous for consumptives to employ any remedy on their own responsibility. It can not be reiterated too often, that consumption requires the most careful and constant detailed supervision by a trained physician. The question of life or death may hang on the slightest thread.

A preliminary condition for recovery is the conscientious observation of the following hygienic measures: If the patient lives in a district which is dusty and smoky, he should at once leave it, selecting a place remote from the noise of cities, and free from manufacturing plants. Localities situated in the neighborhood of water and forests, and protected (either by trees or by hills) from penetrating winds, are most suitable. The patient should pass the entire day in the open air, taking frequent short walks in the course of the day, but being careful not to fatigue himself. The season permitting, he should even take his meals in the open air. Dwelling-rooms and bedrooms must be frequently ventilated, and the windows should be kept open even when the patient is in the room; naturally with avoidance of drafts. It is an erroneous belief, which is still too prevalent, that it is injurious to sleep with the bedroom windows open. The air to be inhaled is contaminated, and insufficiently renewed, even in large bedrooms, if the windows be kept closed.

Continuous outdoor life necessarily requires that particular attention be paid to the dress, in order that colds, and consequent aggravation of the condition, may be avoided. The feet must be kept uniformly warm by good footwear, and the stockings should be changed daily if possible. The underwear should be porous and absorbent; and the outer garments should be more or less heavy according to the weather (see DRESS). Even in summer the patient should take no walk without carrying a cloak or plaid with him, in order that he may prevent a too rapid cooling of the body in case he begins to perspire. Especial precaution is necessary when sitting in the open air. One should not be deceived by the pleasant sensation of coolness which is felt by sitting in a strong draft of air during hot weather, for a too marked cooling of the body is liable to cause increased suffering for the patient.

In order to aid metabolism, and to render the skin more resistant, dry or moist, tepid, cool, or cold rubbings may be recommended according to the patient's strength. Some conditions of the disease may require moist packs. Only the carefully observing physician will be able to choose correctly in this respect; and it is the duty of the patient conscientiously to follow the directions as given, even if they entail some inconveniences. It is always

imperative to be especially careful with the rubbing down of the patient, as well as with the dry packs, so as to prevent fresh colds which will aggravate the disease.

The patient's nutrition is of great importance in determining his fate. Hence, every digestive disturbance must be speedily combated. In feeding the patient, the governing principle should be: "often, little, and good." One should try to introduce variety in the choice as well as in the preparation of the food; and if necessary to stimulate the appetite, spices should be used.

No special diet is necessary so long as the digestion is not disturbed. A plentiful mixed diet is preferable to any form of one-sided nutrition, as the latter is very apt to cause a distaste. Artificial food preparations, as well as the numerous substitutes for meat, should always be considered merely as makeshifts. The most important foodstuffs are, therefore: Meat, milk, eggs, butter, rice, farinaceous foods, fresh or canned vegetables, and stewed fruits. Milk, as is well known, is the foodstuff which best combines all the nutritious elements needed by man, and which, besides, is most readily borne by the stomach. Since the remotest times milk has played an important part in the dietary of tuberculous patients. It should not, however, be given to the exclusion of other foodstuffs. If its continued use in the pure form causes a distaste, it may be given as buttermilk, kephir, or kumiss, or in soups, coffee, tea, or cocoa. Eggs are also advisable in every form: raw, soft- or hard-boiled, fried, scrambled, or in omelettes.

As to the use of alcohol, moderate amounts of beer or of good wine may be allowed if the patient is accustomed to them; or when they are known from experience to stimulate the appetite. But as a rule it may be said that more harm than good results from the use of alcoholic drinks. The question as to whether a consumptive may smoke depends essentially upon whether or not tobacco-smoke causes him to cough. If it does, the use of tobacco must be given up entirely. But, even if it does not, no more than two mild cigars should ever be smoked in the course of one day; and these should be smoked in the open air and with several hours' interval. Cigarettes should be regarded as injurious.

The treatment of consumptives in sanatoriums is a subject of vast importance. As a rule these institutions are better able than are homes and ordinary hospitals to carry out the special requirements with regard to the diet, as well as with reference to the well-regulated employment of the physical remedies here discussed. Unfortunately, the pecuniary condition of a patient is a determining factor in this respect, and often precludes the possibility of considering them. If, however, the necessary funds are at hand, the patient should enter a well-directed sanatorium as early as possible. The sooner this is done, the greater will be the benefit derived therefrom. It is advisable, therefore, that even patients in whom

merely a suspicion of pulmonary tuberculosis presents itself, decide upon such a treatment. The closed sanatorium at once withdraws the patient from all the harmful influences of his previous surroundings and mode of living; his blood circulation, the activity of his heart, his voice, and his organs of respiration obtain a uniform rest. A suitable diet is strictly adhered to; the amounts of muscular activity and rest are regulated under the supervision of a physician; and, at the same time, the special arrangements of the institute allow the incessant action of pure, fresh air (mostly outdoors), as well as the application of all kinds of hydrotherapeutic measures. The patient learns how to live hygienically, and to be careful of his sputum; and later, provided with the necessary knowledge, he becomes the most ardent advocate of hygiene.

In addition to closed sanatoriums, climatic health-resorts are to be considered. These, however, present the disadvantage that the patients are left to themselves, depending only upon occasional examinations by the physician on whom they call according to their own pleasure. A strict supervision is lacking, and transgressions of given directions are almost unavoidable.

An attainment of the last decade is the establishment of state sanatoriums, which enable also the poor to enjoy the benefits of treatment in these institutions. As far as experiences have shown hitherto, these sanatoriums have proved excellent; and if, as is planned, the discharged patients, by light farm or gardening work in rural colonies, are gradually reaccustomed to a regular occupation, it may be expected that the effects of the cure will last for many years,—in favorable cases even permanently. It can not be denied, however, that the return to the former, often unfavorable, domestic conditions, and to callings that are detrimental to health, often annuls the favorable effects achieved.

The fate of the consumptive rests largely in his own hands. In all his actions he should, therefore, bear in mind the guiding principle of Dettweiler: "Pay great attention to details."

TUMOR.—Popular opinion usually designates as "tumor" any morbid change which has caused an enlargement in some part of the body. The physician, however, differentiates between solid enlargements caused by a morbid growth of a certain organ or part of the body, and simple inflammatory swellings, boils, or abscesses. The latter are called *false* tumors, whereas the solid ones are regarded as *true* tumors. It is of importance for the layman to know that there are two distinct groups of tumors; namely *malignant* and *benign*. The former group includes all tumors whose growth is unlimited, taking place at the expense of the body which they gradually cause to perish by destroying important organs. It frequently happens that particles of these tumors are carried by the blood-vessels or lymph-vessels to different parts of the body, where they develop new growths of a

similar nature. Malignant tumors may arise in all parts of the body, and are named according to the composition of their tissues. Popular parlance designates them all as "cancer," but this is very unscientific.

Benign tumors, although they may attain a large size, do not constitute any immediate danger to the body. They show no inclination to multiply in other tissues; and they affect the body merely by the inconvenience they cause, or by constituting a blemish. Among such benign, or innocent, tumors, may be mentioned fatty swellings, warts, and follicular tumors (*atheromata*) of the scalp.

No medical remedies for malignant tumors are known as yet. They should be removed as early as possible by surgical operation. If not removed in time, the patient can not be saved. A number of people delay operation from carelessness, inattention, or fear, or because they believe in the promises of unscrupulous quacks who claim to be able to "cure cancer without the knife." In view of this it is imperative to dwell most emphatically upon the importance of following the advice of the physician, and have all suspicious tumors removed as early as possible. Cancers and tumors of the various organs are discussed under the several headings.

TURPENTINE.—An oleoresin obtained from several species of pine-trees. The American turpentine is largely obtained from the *Pinus palustris*; Canada balsam from the *Abies balsamea*; and Burgundy pitch from a Norway spruce, the *Picea excelsa*. Oil of turpentine, or spirits of turpentine, is a volatile oil having a peculiar odor and taste, and is a distillation product of turpentine. The oil of turpentine is an irritant which acts rather slowly; but as it is quite volatile it has considerable penetrating power, and may produce a deep sore. It is used as a counter-irritant, in a liniment, for rheumatic joints, sciatica, or lumbago. Turpentine stupes are useful over areas of deep inflammation. These are made by sprinkling the oil of turpentine on flannel which is wrung out of hot water. Diluted with some bland oil it is sometimes rubbed on the chest of patients suffering from bronchitis. Internally, oil of turpentine is used as an intestinal antiseptic, particularly in typhoid fever when there is distention. It is sometimes added to an enema for its stimulating effect. Some of its derivatives, as *terebene* and *terpin*, are used in bronchitis. The oil is often given in emulsion in five to ten drop doses. Overdoses cause inflammation of the stomach, intestines, and urinary tract.

TYPHOID FEVER.—A contagious disease, the seat of which is chiefly in the intestine. The cause of this affection has been found to be a bacterium, the *Bacillus typhosus*. How the bacteria enter the human body has not yet been definitely established; but infection probably takes place by way of the intestinal canal. Typhoid occurs sporadically as well as in epidemics. Dissemination of the germ is generally through the intestinal or urinary evacuations of the patient, as the urine and feces contain typhoid-

bacilli. These bacilli may adhere to the bed, to the clothing, to the chamber, or to any other articles used by the patient; and they are capable of conveying the disease even weeks after they have dried. On the other hand, direct contagion from person to person does not seem to take place as in the cases of measles, scarlet fever, smallpox, etc. According to the ground-water theory of the Bavarian hygienist, Max von Pettenkofer (1818-1901), the earth is the chief breeding-place of the typhoid-bacillus. The disease is always most prevalent in places where the ground-water is deep. Also the drinking-water, the character of which is often dependent upon the composition of the earth, is an important factor in the dissemination of typhoid. In a large number of epidemics it has been proved beyond a doubt, that the disease originated in places where the drinking-water was drawn from wells which were situated near drains, sewers, and the like. The contamination of a spring from polluted earth may cause an entire district to become infected with typhoid. In some cases—less frequently, however—the germs have been transmitted through the medium of milk or other articles of nourishment. The intestine is the place in which the bacilli primarily attach themselves. A certain natural predisposition seems, however, to be necessary; for even in the most severe epidemics there are always some individuals who escape contagion, even though they come in close contact with typhoid patients.

The development of typhoid usually takes place in about 10 to 14 days after infection. During that time the patient may feel in the best of health; or he may complain, toward the latter part, of chilliness and general lassitude. A slight headache may be present. As the general infection spreads,—for typhoid is to be considered as a general, not as a local disease—the malaise increases, the headache becomes more severe, the bones become painful, and there may be nausea, vomiting, and diarrhea. Constipation may, however, be present in the early period.

The rise of the fever is very characteristic in typhoid. For the first week it goes up slowly, each evening higher than the evening before, and falling each morning; yet steadily ascending day by day. The patient feels sicker and sicker. On the fourth, fifth, or sixth day, a mild eruption may appear. During the second week the temperature remains high; about 104° to 105° F. every evening, and 102° to 103° F. every morning. During this period the weakness of the patient becomes more and more pronounced. The tongue is dry and red lined; the lips and gums are apt to be dry; the back aches; and the patient emaciates. He may be delirious at night—either wild, or in a low and muttering state (*typhoid state*). At this time the diarrhea may be very persistent, or there may be a distinct constipation. At the beginning of the fourth week the temperature descends as gradually as it went up in the first week; and convalescence usually begins at the end of four weeks. The patients are still sick, however; and great care must be taken

that they do not get up too early, even if they feel well. See temperature-chart of typhoid fever (Fig. 67, *d*; p. 88).

The majority of cases of typhoid fever occur in the autumn and in the early part of winter. The disease generally attacks young persons between the ages of fifteen and thirty years, frequently also children; never infants, and very rarely aged people.

There are many exceptions to the usual course of the disease just described. Of most importance are the dreaded occurrences which may appear at the acute stage of the disease. These retard convalescence, and are sometimes fatal. There are two chief dangers:—intestinal hemorrhages, and perforation. These usually occur in the third week, and result from intestinal ulcers caused by the typhoid bacilli. The patient may recover from the hemorrhages, but perforation is generally fatal. In many cases the patient suffers a relapse at the end of the disease, which is generally caused by some error in diet, and this relapse is at times more severe than the original attack.

In the treatment of typhoid, great progress has been made during the last decades. Medical treatment has been almost totally discarded, as it has proved fruitless. On the other hand, splendid results have been attained from treatment directed toward sensible nourishment, appropriate use of water, etc. On the appearance of the first symptoms of the disease, the patient must go to bed, and must remain in bed until after the final disappearance of fever. As long as there is any fever, the nourishment must be very scanty, and entirely fluid. During the first week, only milk, tea, lemonade, and wine should be given. In the second week broths and cocoa may be added, and in the third week paps. Solid food may not be given until after recovery. The patient's appetite may have to be restrained so as to avoid indiscretions in diet. After the healing of the ulcers, the patient generally recovers very rapidly; the nourishment is thoroughly digested, and in a few weeks the loss in weight has been regained.

The cold baths introduced by Dr. Brandt of Stettin have been of great benefit in the treatment of typhoid. They reduce the high fever, and clear the brain. Two or four baths are given daily, according to the patient's condition. The bath should last 10 minutes, and the patient must be carefully lifted in and out. The baths, as well as the general treatment of typhoid, should be given under the supervision of experienced nurses; otherwise serious results may arise. Care must also be taken that the patient does not get bed-sores during his prolonged stay in bed. The treatment of any accidental occurrences must be entirely according to medical advice, which in such a severe disease is necessary throughout.

In order to prevent contagion, the rules given in the article on **DISINFECTION** must be conscientiously followed. They should be observed until three weeks have elapsed after the disappearance of the fever.

TYPHUS FEVER.—An infectious febrile disease; called also jail-fever. It has nothing in common with typhoid, except that, like the latter disease, it occurs almost exclusively in epidemics. Typhus is principally a disease affecting people who live under unfavorable conditions; and for this reason it is frequently called "hunger-typhus." Neither the cause of the disease, nor the mode of dissemination, nor the part of the body which it primarily affects, are known.

Following the prodromi, or premonitory signs,—which persist for several days, and consist of lassitude, headache, and pain in the limbs—the attack commences suddenly with a violent chill and high fever, often followed by vomiting. An intensely severe headache soon sets in; or the patient may fall into a stupor and become delirious. The skin is hot and dry, and is covered with a rash which rapidly spreads over the entire body, and which resembles the eruption of measles. After a few days these spots show signs of bleeding. The fever, which is constantly high during the first week, usually recedes during the second week, and the general condition then begins to improve. The temperature usually becomes normal in a day or two; rarely by more gradual stages. Finally the rash fades, and recovery soon sets in. In severe cases, however, death occurs under increased cerebral disturbances, which result from intoxication by bacterial poisons that have passed into the blood. The mortality in typhus epidemics fluctuates between 6 per cent. and 20 per cent.

There is no remedy known which can influence the course of typhus fever. The danger arising from the high fever and the brain symptoms are best combated by cold baths. This, as well as the treatment of secondary affections that may supervene, is the concern of the physician.

U

ULCER.—An open sore on an internal or external body surface. It is due to an inflammatory process in the skin or in the mucous membrane, which process causes more or less destruction of these tissues and of the underlying structures. Some ulcers are caused by external agents, such as burns, injuries, corrosions, etc.; others are due to local disturbances in the nutrition of the skin, owing to nervous influences or to impaired circulation of the blood; still others are caused by acute or chronic infectious diseases, such as diphtheria, typhoid, tuberculosis, syphilis, etc.; and others again represent malignant growths, which appear as ulcers only because of tissue disintegration.

It follows that the variety of ulcer from which a patient may suffer can not always be determined offhand. A careful examination is often

necessary to discover the underlying cause. Certain varieties of ulcers, however, have characteristic forms and appearances, which render them easy of recognition. A venereal ulcer, for instance, has a grayish or sloughy floor, and a well-defined, sloping edge.

The treatment of an ulcer depends entirely upon its cause, and to establish this is, therefore, of primary importance. Many ulcers will not heal, in spite of the greatest care, until the underlying affection has been removed. Diabetes furnishes an illustration of this. Unprofessional treatment, though it may sometimes result in alleviation or improvement, is usually inefficacious, and very often harmful.

The dangerous nature of an ulcer has in many cases no relation whatever to its size or to the inconvenience it causes. Many small ulcers, as cancer of the lips or of the tongue, may eventually, with improper treatment, endanger the life of the patient. From this it follows, that careful medical observation is necessary in such cases. For internal ulcers, as of the stomach, intestine, and other organs, see the various headings. Ulcers of the leg are discussed in the following article.

ULCER OF THE LEG.—Ulcers are found rather frequently on the leg; not in connection with any general disease, but conditioned by disturbances of the circulation of the blood. These disturbances are caused either by varicose veins, or by a sluggish flow of blood in the veins, owing to much standing or walking. They may be caused also by repeated inflammation of the leg, arising from uncleanness, from slight wounds, or from wounds that have not been properly cared for. In a leg with varicose veins, the blood-vessels, which appear bluish as seen through the skin, gradually come nearer and nearer to the surface, and occasionally burst, either spontaneously or as the result of some slight wound. In consequence of a poor nutrition of the skin, and insufficient care of the leg, these small wounds do not heal; on the contrary, they generally grow larger, at the expense of the surrounding skin which has but little power of resistance. They usually cause much annoyance and pain.

The treatment involves great care, as well as much technical experience. Treatment is best carried on in bed, with the leg in an elevated position, and with applications of moist bandages or salves, according to the extent of the ulcer. The most disturbing feature is the fact that they often reappear after having been cured, until the fundamental cause (the varicocities) has been removed. The injurious effects are mitigated by enveloping the leg from

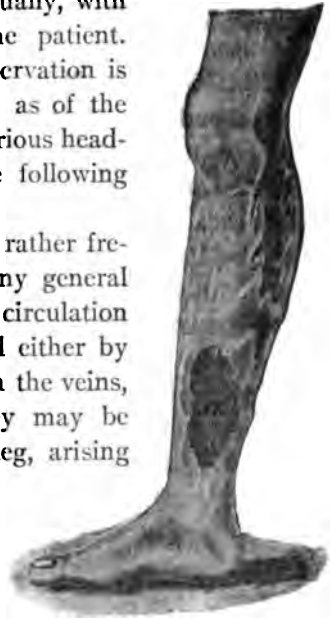


FIG. 427. Varicose veins and ulcer (a) of the leg.

the toes to the thigh with flannel, rubber, or tricot bandages. The last-named are the best. Entire removal of the ulcer can be effected only by operation.

Ulcers not caused by varicocities appear mostly on the lower third of the leg (see Fig. 427), and are characterized especially by their wide-spread and rapid extension, and by the reddened, inflammatory condition of the adjacent parts. The skin is usually brownish-red in color, and is compact and hard. The longer these ulcers are neglected, and the less care the patient takes of himself, the more the margins of the ulcers spread, and the more difficult it becomes to heal them. The removal of an ulcer necessitates a more or less prolonged rest of the leg, in bed if necessary. Careful nursing, and cleansing of the surface of the ulcer, are likewise important. Bandaging the leg, as described in the foregoing, is very serviceable in these cases also.

UNCONSCIOUSNESS.—The complete abolition of cerebral activity produces a condition of unconsciousness which may last for a brief period of time (*faint*) or be considerably prolonged (*apparent death*). The affected individual neither sees, feels, nor hears; he lies still, without making any movements, and the limbs are completely relaxed. The pulsations of the heart, and the movements of the chest are the only indications that life exists. The condition may result from a sudden anemia of the brain, from cerebral concussion or disease, from convulsions, and from intoxications. Among intoxications may be included also the comatose conditions associated with diabetes and inflammation of the kidneys, in which diseases the system itself produces the toxic substances. Patients suffering from a high fever are not usually unconscious, but merely benumbed: their consciousness is not abolished, but merely obscured. They answer when loudly called, and may perform voluntary movements.

Since the most varied kinds of illness may produce unconsciousness, there is no one method of treatment. The latter depends entirely on the original disease, which the physician must first recognize before any remedial measures can be instituted.

If a layman is called upon to render assistance in a case of unconsciousness, he should immediately loosen all constricting parts of the patient's dress, and place the head low if the face is pale, or elevate it if the face is red and flushed. If vomiting occurs, the head should be turned to one side, so that the vomited material may not get into the windpipe and thence into the lungs. If the unconsciousness is due to an epileptic fit, which is characterized by twitching of the limbs and the appearance of froth at the mouth, the patient should be left alone, a pillow or some other soft object being placed under his head so that no injury may take place. When respiration has ceased in an unconscious person, **ARTIFICIAL RESPIRATION**, as described under that heading, should at once be applied.

UREMIA.—A form of chronic poisoning, due to the retention of products which under normal conditions are excreted by the kidneys. Chronic or acute inflammations may cause the kidneys to lose the power of performing their natural functions, so that substances which should have been excreted with the urine are retained in the blood and in the tissue-fluids of the body. Here these waste-products produce a number of symptoms of poisoning which represent a much-dreaded complication of disease of the kidneys.

The onset of uremic poisoning is usually preceded by a diminution or cessation of the discharge of urine, by loss of appetite, and by nausea, vomiting, marked headache, restlessness, shortness of breath, and diarrhea. These symptoms may be accompanied by vertigo, slight stupor, sudden disturbances of vision, twitchings in the face and in some of the limbs, and even by convulsions which may last for hours and be attended by complete loss of consciousness. Many of these symptoms occur either singly in the course of disease of the kidneys, or develop simultaneously at longer or shorter periods.

Great attention should always be paid to the premonitory signs of uremia, as timely medical aid may in many cases arrest the full development of the disease. The withdrawal of large quantities of blood by means of venesection has proved very effective according to numerous observations.

URINE.—A fluid which is secreted from the blood by the kidneys. It consists of water containing various salts in solution (see p. 59). The quantity of urine passed by a healthy individual averages about three pints a day. Much, however, depends upon the quantity of fluid ingested. The amount of urine is increased in diabetes, in contracted kidneys, and during convalescence after acute diseases; whereas it is usually diminished in fever, in acute inflammation of the kidneys, in uremia, and in congested kidneys.

Under normal conditions urine is amber-colored, but it becomes lighter or darker according to the substances which it contains. When containing blood, it is red to brownish-red in color; after the use of antipyrin, rhubarb, or senna, it becomes red; if bile pigment be present, its color is yellowish-brown to black (like porter). On cooling, urine separates a yellow or reddish sediment resembling brick-dust, which firmly adheres to the walls of the vessel. This sediment consists of uric acid salts, and not of blood as is often erroneously assumed. These salts are present in all urines in summer as well as in winter. To prove this, it is only necessary to place a dish containing urine in a cool place (an ice-box) when, after 12 to 18 hours, the red crystals of uric acid will be formed. The dangerous condition consists in *not* having them. A slight cloudiness develops in all urine upon standing for some time; but if the urine be cloudy when passed, it is a sign of some disease of the kidneys or of the bladder. The smell of normal urine is not offensively aromatic; it becomes pungent if the urine is putrid or decomposed. Characteristic changes in smell take place after the ingestion of asparagus (offensive), copaiba (aromatic), turpentine (odor

1. 1. 1.

2. 2. 2.

3. 3. 3.

4. 4. 4.

5. 5. 5.



of violets), etc. For the effects on the color, composition, and secretion of urine in various diseases of the **BLADDER** and of the **KIDNEYS**, see under those headings.

URTICARIA.—See **HIVES**.

UVA-URSUS.—The leaves of the bearberry, or *Arctostaphylos Uva-ursi*, an evergreen herb. It contains two active glycosides, *arbutin* and *methyларbutin*, in addition to tannin and various other substances. It acts as a mild diuretic, and as a stimulant to the urinary tract. Uva-ursi is used in affections of the kidney, bladder, and urethra. After its use the urine is often dark colored on account of the presence of hydroquinone, a compound resulting from the breaking down of the arbutin. Uva-ursi is commonly administered in the form of infusion, which is given in doses of one to two tablespoonfuls.

V

VACCINATION—Historical Notes.—The struggle against epidemics, the great plagues of the human race, has been carried on in a great many ways in the course of times, when mankind, conscious of its impotence against the invasion of the evil, despaired under its sufferings. The means employed in the warfare against disease furnish an index as to the cultural state of the people at different periods. From the sacrifice of human beings, from the massacre of animals immolated to pacify the ire of the gods, the road has led to castigation, to pilgrimage, and to expiation. The present time endeavors to prevent epidemics by hygienic improvements and, when these are not sufficient, by measures which tend to render the population immune to the evil. Although many of these measures entail inconvenience to the individual, they are, as a rule, willingly borne for the welfare of mankind as a whole. The greatest success attained by any measure of this kind was achieved by vaccination, a system of inoculation with cowpox as a preventive of smallpox, which was introduced on May 14, 1796, by the English physician Edward Jenner. The pestilence of smallpox, which had raged for thousands of years, has yielded to this measure. The disease has receded in the same ratio as vaccination has been carried out. Smallpox is practically unknown where thorough vaccination is practised.

Smallpox, known to have existed more than 3,000 years ago in India and China, and probably introduced into Europe in the year 180 C.E., was a universal, murderous plague which, toward the end of the eighteenth century, destroyed about 400,000 persons a year in Europe alone. At that time Europe had about 200 millions inhabitants, so that about one person in every five hundred died of smallpox. This death-rate approaches the present mortality of consumption. From this comparison it is obvious that small-



HERBS

1. Poison hemlock (*Conium maculatum*)
a. leaves b. flowers
2. Water-hemlock (*Cicuta virosa*)
a. leaves b. root
3. Parsley (*Petroselinum sativum*)
a. leaves b. flowers
4. Garden chervil (*Anthriscus cerefolium*)
leaves and flowers
5. Root of henbane (*Hyoscyamus niger*)
6. Root of parsnip (*Pastinaca sativa*)
7. Deadly nightshade (*Atropa Belladonna*)
flowers and fruit
8. Capsule of poppy (*Papaver somniferum*)

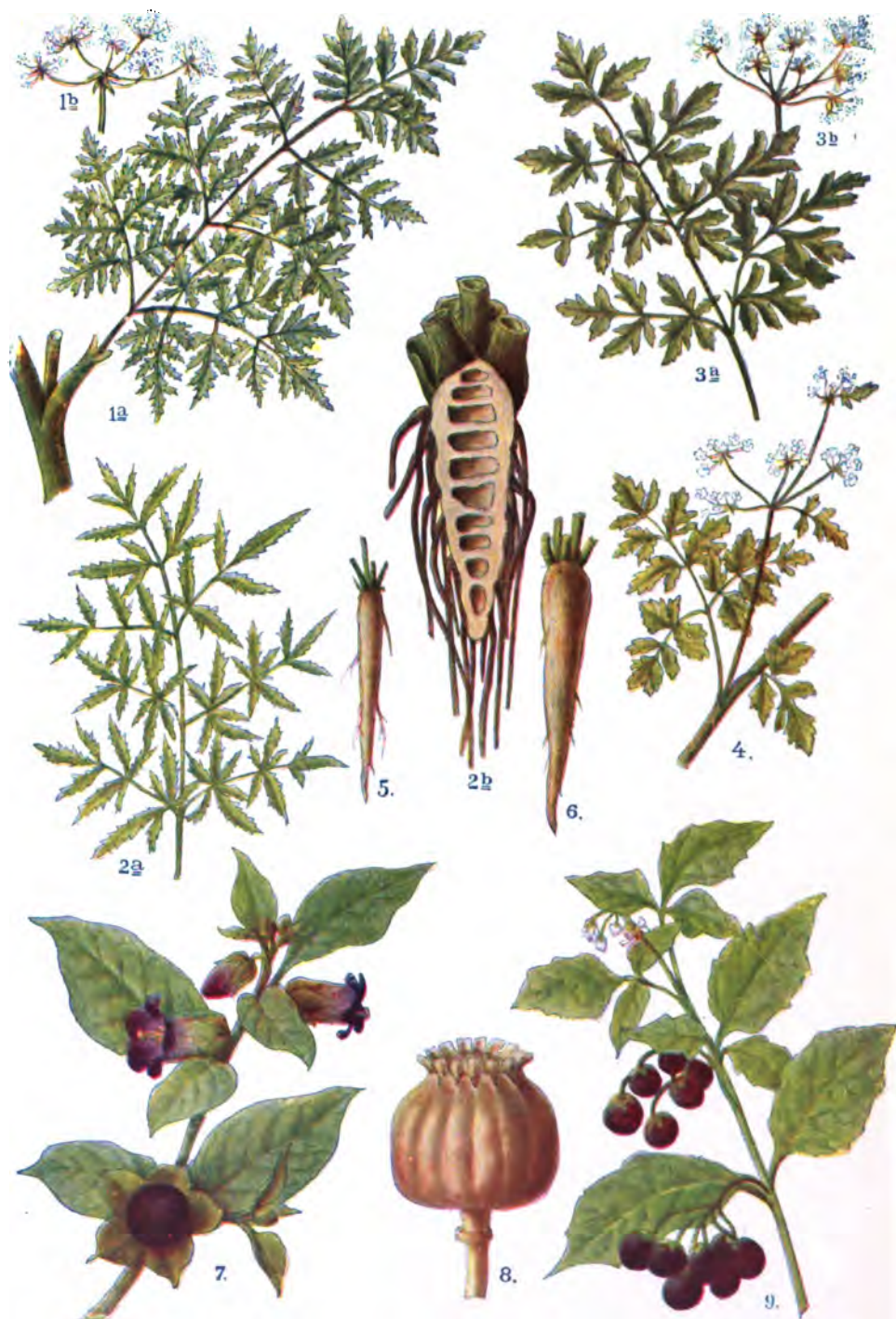
PLATE XXIII.—HERBS

Poisonous

Notes.

Non-poisonous

1. Poison hemlock (*Conium maculatum*)
a. leaves b. flowers
2. Water-hemlock (*Cicuta virosa*)
a. leaves b. root
5. Root of henbane (*Hyoscyamus niger*)
7. Deadly nightshade (*Atropa Belladonna*)
flowers and fruit
9. Common, or black, nightshade (*Solanum nigrum*); flowers and fruit
3. Parsley (*Petroselinum sativum*)
a. leaves b. flowers
4. Garden chervil (*Anthriscus cerefolium*)
leaves and flowers
6. Root of parsnip (*Pastinaca sativa*)
8. Capsule of poppy (*Papaver somniferum*)



pox was very much more dangerous then, than measles, scarlatina, and diphtheria are now. Smallpox was, and still is, quite as infectious for people of every age, as measles is for children. This fact conclusively demonstrates the great value of vaccination. Just as most adults are immune to measles because they have had the affection in childhood, just so is the vaccinated individual immune to smallpox because the successful inoculation with cowpox has practically the same immunizing effect as an attack of the disease.

Medical science had been able to accomplish but little against the severe forms of the terrible malady of smallpox. This suggested to the ancients the idea that the course of the disease—which they regarded as inevitable—might be somewhat modified by purposely bringing about infection under favorable conditions. Thus healthy persons were, during an especially mild period of the epidemic, led to the bedside of patients for contagion; or the contents of the pustular eruption were inoculated into the skin of the healthy. Those inoculated were made to live temperately, and to keep as much as possible in the open air; and the contents of the pustules developing at the *point of inoculation* were subsequently utilized for the further propagation of the protective process. The inoculated persons generally suffered from a mild, abbreviated form of the disease. History records that the Chinese practised this method 3,000 years B.C.

In Arabia and Africa the pocks were inoculated with a needle. The Arabian custom was practised also in the ancient Georgia and Circassia, where it was principally employed in order to protect the girls destined for the harem from being disfigured by smallpox. The wife of the English ambassador—Lady Montague—learned of smallpox inoculation in Constantinople; and when she returned to England in 1717, she had her own children inoculated in this manner. As this courageous step was seen to have no serious consequences, inoculation tests were undertaken by the English government, first on criminals, then on orphans. After all these experiments had terminated favorably, the children of the king were inoculated. This ennobled the new protective measure. It was generally imitated, and the results were fairly favorable. The mortality among the inoculated amounted to only 0.3 to 2 per cent. Although this was an extraordinarily favorable proportion in comparison with the usual percentage of deaths from smallpox, these deaths offered to the clergy and to many physicians an opportunity for opposing the introduction of inoculation.

Scandinavia and Russia were among the countries that first imitated the example of England. Inoculation was practised less generally in France, Italy, and Germany, because it was perceived that the inoculated persons were, after all, subject to some danger, and were able to infect others. In fact, there are reports that inoculation of the pocks caused the outbreak of epidemics of smallpox in places which were unaffected at the time; but

the calamity of smallpox was so great, and the danger of contagion from the inoculated was so considerably less than that from the natural disease, that recourse was again had to this preventive measure. Inoculation remained a sheet-anchor which, thrown out in the emergency of smallpox, rendered assistance to many although it injured a few; but a feeling of relief went through the world when Jenner's discovery—vaccination—became known. After the discovery and introduction of vaccination, the former method of inoculation was prohibited everywhere.

Some observers, who paid attention to occurrences among their domestic animals, had noted that occasionally persons who had been infected by an eruption resembling smallpox at the teats of cows (cowpox), remained exempt in subsequent epidemics of smallpox. By the hands of the milkers, this eruption was transmitted from one cow to another, until all the cows of one stable were infected by the disease. If the milkers had small abrasions on their hands, they, too, became affected with the same pustules. When the contents of these pustules were transferred to other persons by means of the small cuts or punctures, this "inoculation" would give rise to similar symptoms. Cows and human beings inoculated in this manner with the substance of cowpox become insusceptible to a second transmission, and become immune to smallpox also.

Humanity owes the scientific demonstration of this process to the indefatigable investigations of Dr. Edward Jenner of Berkeley, England. Jenner's attention was called to the subject of cowpox by a farmer's wife. It is reported that she, in the presence of young Jenner, said to a certain Dr. Ludlow: "I shall not become infected with smallpox, because I have had cowpox." Jenner did not publish his paper relating to this subject until 1798, thirty years later. For three decades he investigated this question, which soon became clear to him. He became so firmly convinced of the correctness of the countrywoman's statement, that in 1789 he inoculated his first-born son with the contents of pocks occurring in the pig, after he had found that the pocks also of other animals than the cow had inherent protective powers similar to those of cowpox. His son subsequently proved himself to be immune to smallpox, after he had been inoculated with them in the customary manner.

Jenner held back his observations for a long period. Later they remained unnoticed for some time. They did not become serviceable until Jenner, on May 14, 1796, began to transfer the substance of cowpox (*vaccine*) successfully from arm to arm after the manner of inoculation. On this memorable day Jenner inoculated a boy, Phipps, with the contents of a fresh cowpox-pustule from the hand of a milkmaid, Sarah Nelmes. The girl's hand, which was scratched by a thorn, had become infected while she was milking a cow affected with cowpox. The girl as well as the boy became immune to smallpox, as was subsequently proved by control inoculations.

After a few further observations to verify the accuracy of the results obtained, Jenner published, in 1798, his paper on vaccination, which was received with great enthusiasm.

The feeling of delivery from the plague of smallpox was disseminated over the entire world. The new method was most eagerly adopted and approved of in all countries; and Jenner was the hero of the hour. Even Emperor Napoleon, a sworn enemy of the English, humbled himself before the genius of Jenner; and at the intercession of the latter he released many English prisoners. Vaccination everywhere proved itself to be a sure preventive; and, contrary to the method of inoculation formerly practised, it neither endangers life nor causes contagion. Made known in 1798, vaccination was introduced into several countries during the following years. With the wide use of vaccine at the beginning of the last century, smallpox became extinct almost everywhere.

The belief soon prevailed that smallpox had been entirely conquered. But the assumption, that the protection afforded by vaccination lasted for life, proved to be erroneous. The immunity runs out, as it were, after a certain length of time. The number of cases of smallpox in vaccinated persons increased during the "twenties" of the nineteenth century, although the infection was mild. In the course of a few decades, epidemics occurred which became more marked, the severest appearing in the beginning of the "seventies" when, in some localities, there were as many victims as in the time preceding Jenner. The disease, however, seemed to have changed its character. In former times it had been an affection of childhood, but after the introduction of vaccination it became a disease of adults and of the aged. In middle-aged patients it ran a mild course, and became dangerous only to old people. The longer the period that had elapsed since vaccination, the more severe was the affection. Whereas scarcely a single attack of smallpox occurred before the seventeenth year in those who had been vaccinated once, the greatest number of deaths from smallpox took place among unvaccinated children, and among old persons who had not been revaccinated since childhood.

The epidemic of the years 1870 to 1873 again proved the advantages of vaccination, as well as the inadequacy of the vaccination-laws in force at the time. So strikingly was this shown, that the German Reichstag, in 1874, passed a new vaccination-law, which directed the vaccination of small children and the revaccination of those of twelve years of age. From then on smallpox has become extinct in Germany, as well as in all countries that have enlightened vaccination-laws. So rare is the disease at present, that many physicians never see a case of smallpox.

Course and Treatment of Vaccination.—Vaccination should be performed only by a qualified physician. It is best performed with a sterilized needle and sterilized cow-vaccine lymph. One or more areas, two-fifths of an inch

square, on the arm or leg, are scarified, after thorough cleansing. The vaccine is then rubbed in until dry. For a few days nothing happens. Then, on the third or fourth day, the area reddens and becomes swollen; on the following day a vesicle appears, and the patient is usually slightly upset. The vesicle grows more full, and by the eighth or ninth day it is complete. It is pearl-gray or yellowish in color, and slightly depressed in the center, with reddened borders. The lymph-glands in the armpit are slightly sensitive at this time, and are moderately thickened; and fever is at its height between the sixth and the eighth day. On the ninth day the symptoms recede, the fever disappears, the redness fades, and the pustules dry into crusts which are cast off between the twentieth and twenty-fourth days, leaving a scar which in most cases remains visible for life. From the twelfth day on, after successful vaccination, the inoculated person is immune to smallpox, and to the local effect of revaccination. This protection by vaccination, however, does not prove itself to be as lasting as the immunity conferred from the disease itself. The reaction after revaccination, which should be done in the twelfth year, is not as marked as in the primary vaccination. Its entire course lasts only from a week to ten days. In a great many cases no pustules are formed, but only nodules which dry off very quickly, and usually leave no distinct scars. Many children have a very sensitive skin, and, after being vaccinated with strong vaccine, they suffer from severer inflammatory symptoms than is usually the case. But these, too, recede from the ninth day on.

The regular course of the vaccination process may be disturbed by an irregular conduct of the vaccinated. This should be borne in mind by parents, and they should act accordingly; for the inoculated child is weak for several days, and needs indulgence. Much depends upon the pustules drying without rupturing, because pus-producing germs and other bacteria may enter the ruptured pustules and disturb the healing process. Vaccination should be avoided during the hot period of summer. Children suffering from scrofula or other illness, should not be vaccinated while these processes are active. Before vaccination is performed, the child should be washed, and dressed in clean garments. The site of vaccination must be scrupulously cleaned. The greatest possible cleanliness must be observed also after vaccination. The usual baths or the daily washings should be continued; and no change should be made in the child's diet. If the weather is favorable, the child should be taken into the open air, but should not be exposed to the heat or to the direct rays of the sun. The vaccination wounds must be kept carefully clean, cool and dry, and must be touched only with clean hands. For washing, one should use only clean gauze, or clean absorbent cotton. After having touched the places of vaccination, one should wash the hands. A vaccinated person should be carefully guarded against contact with individuals who suffer from suppurating ulcers, skin eruptions,

or erysipelas; and objects used by such patients should be kept away from the vaccinated.

In the regular course of vaccinia the wounds may be covered with soft, clean linen. A bandage is unnecessary. The shields sold in the market are usually more harmful than beneficial, especially late in the course of the vaccinia. One should avoid dressing the pustules with greasy or oily substances; and cold-water compresses—which, unfortunately, are recommended by so-called “natural” healers—should not be used. They soften the pustules so that they readily rupture, and are liable to infect the wound. Inflammatory redness, which may appear when the pustules are in blossom, is best relieved by washing with clean water that has been boiled. If the pustules burst, they should be treated as any septic wound. Further incidents, which, however, are very rare, require the advice of a physician.

Vaccine.—This is prepared in a special manner. The human virus was used for many years, and arm to arm vaccination practised. This is not advisable, as communicable diseases may be thus transferred from child to child. Only vaccine derived from the calf should be used. Experiments along these lines were undertaken in Naples as early as 1810. Animal lymph was first exclusively used in Germany, after the German vaccination-law, in 1874, had decreed the revaccination of all children of twelve years of age, and the necessary vaccine could not be procured in sufficient quantities from the arms of other children.

At the present time there exist, in all civilized countries, establishments where animal lymph is made for the market. The animals are kept under strict veterinary supervision, and only healthy animals are used. The vaccine manufactured is also tested as to its efficiency.

Objections to Vaccination.—It is not astonishing that many unthinking, narrow-minded persons submit reluctantly to compulsory vaccination, looking upon it as a disagreeable measure which apparently is of no obvious benefit. This opposition to vaccination arises partly from ignorance, partly from a desire for publicity and self-advertisement, especially on the part of natural healers. To carry out their propagandas, and to provide themselves with salaries, they issue pamphlets and monthly publications, hold public lectures, etc. For the most part they do not shrink from the use of exaggeration and malevolent misrepresentation in order to cast a slur upon the object of their ire. Vaccination is represented as a monstrous oppression of personal liberty and of the freedom of conscience, undertaken to fill the pockets of physicians. Or it is said to be a means of disseminating wound-diseases, as well as infectious diseases of the worst kind—scrofula, tuberculosis, syphilis, etc.

As to the contention that vaccination disseminates wound-diseases, it may be asserted that such diseases rarely occur in vaccinated persons, if all precautionary measures are carefully observed; and the very few cases

that do happen, can almost invariably be traced to inattention and carelessness on the part of the vaccinated persons or their relations. Parents who conscientiously heed the advice here given, need not be alarmed. The other contention of the opponents of vaccination, that this measure propagates infectious diseases, has become absolutely void since the introduction of animal lymph, and since precautionary measures are observed in the preparation of this lymph. Such transmission is conceivable if human lymph is used, but it is impossible when animal lymph is employed.

In spite of the obvious shallowness of the anti-vaccination libels, however, these nonsensical defamations have met with great approval among the adherents of the so-called "natural methods of healing." Numerous

publications disseminate this approval. Fortunately, however, too much sound judgment prevails among all classes to misjudge the value of this great preventive measure. Vaccination causes much less harm than the usual games indulged in by young people, such as gymnastics, dancing, running, ball-playing, etc.; and certainly no one would wish to abolish any of these.



FIG. 428. Fountain-syringe.

VAGINA, DISEASES OF.—The vagina may be entirely or partly absent. In such cases, if the womb exists, an operation is necessary to permit menstrual blood to be discharged. Relaxation of the vagina, after childbirths, or in old women, may cause the same to prolapse; that is, it may partly or entirely project from the genital organs. Treatment is by pessaries or by operation. See *Displacement of the Womb*, s. v. **WOMB, DISEASES OF.**

Catarrh of the mucous membrane of the vagina (*leucorrhea*) is a very frequent affection. It is characterized by the presence of a milky discharge, which in severe cases may become purulent, corroding the external genitals. The chief cause of vaginal catarrh is uncleanness. Simple leucorrhea may be due also to a lowered physical state. Examination by a physician is necessary in these cases, as well as in tumors and fistulæ of the vagina.

Fistulæ usually result from pressure during protracted labor. They are generally situated between the bladder and the vagina, and are brought about by the pressure of the infant's head causing the tissue between the bladder and the vagina to mortify. The necrotic tissue is discharged, and an opening between bladder and vagina is the result. This causes a constant discharge of urine through the vagina. This most disagreeable affection can be cured by surgical intervention.

VAGINA, IRRIGATION OF.—Warm cleansing irrigations are used in cases of leucorrhea (whites) due to a chronic inflammation of the vagina or of the womb. For this purpose an irrigator or a fountain-syringe may be

used. The end to be introduced into the vagina should preferably be a glass tube with several openings; hard rubber nozzles, however, answer the purpose. Fountain-syringes (see Fig. 428) are to be preferred to any other form of instrument for cleansing the vagina. The hand should be washed before as well as after each irrigation. When not in use, the nozzles may be kept in a one per cent. lysol solution. The same solution is suitable for the irrigations also.

Hot irrigations for the vagina may be used once or twice a day, at a temperature of 110° to 125° F., for the treatment of inflammation of the womb and its surroundings. These irrigations require large quantities of water, —at least four quarts every time. In order to protect the perineum (the space between the anus and the vaginal opening) from the hot water, the nozzle of the syringe should be introduced as far as possible into the vagina. One irrigation should be taken in the evening before retiring; and another one in the morning. After taking the morning irrigation, the patient should remain in bed for an hour.

VAGINAL CATARRH.—See VAGINA, DISEASES OF.

VAGINAL FISTULA.—See VAGINA, DISEASES OF.

VALERIAN.—The rhizome and rootlets of the *Valeriana officinalis*, a herb growing in Europe. It has a very peculiar odor and taste. Its active principles are an oil, and valerianic acid. Valerian is a mild nerve-sedative, being used to quiet nervousness or hysterical excitement. The dose of the fluid extract is about a teaspoonful.

VARICOCELE.—An affection characterized by a marked dilatation of the veins of the spermatic cord. A great variety of varicoceles may be found: from those of very slight severity to those in which extensive swellings of the scrotum are present. The affection is found principally in young adults. It is due to disturbances of the circulation of blood at this point, increasing the pressure on the walls of the blood-vessels, and causing them to yield. The development of varicocele is furthered by much standing, and by constipation, etc.

The symptoms, consisting principally of pain and a feeling of tension, may be relieved by wearing a suspensory bandage. These bandages vary in structure, but generally consist of a pouch which holds the scrotum, and which is attached to straps fastened around the body. Varicocele can be entirely cured by a slight and harmless operation. The wearing of a well-fitting truss may be advisable in certain cases.

VARICOSE VEINS.—Anything that prevents or impedes the flow of the blood which is being returned to the heart, causes congestion of the veins involved; and in consequence of the yielding character of their walls, they become unduly dilated. Such dilated veins are called *varicose veins*, and are found especially in the scrotum (see VARICOCELE), in the rectum (see HEMORRHOIDS), and on the leg, involving the saphenous vein and its branches.

The most frequent cause of varicosities in the veins of the leg is long-continued standing or walking, which is aggravated by wearing tight garters. Severe constipation may also be a factor. The veins gradually become tortuous, and appear like thick, bluish strands which can be seen and felt externally (see Fig. 427). Pouch-like expansions (*varices*) appear in various places; and the blood may coagulate in these knots and become hard, forming the so-called veinstones or *phleboliths*.

The congestion of the blood not only retards its return to the heart, but also exerts an unfavorable influence on the nutrition of the parts involved. This may give rise to skin eruptions. Extravasations of blood into the skin cause it to assume a brownish appearance; and dropsy may develop. Chronic ulcers, which rapidly increase in size, are also liable to be formed (see **ULCER OF THE LEG**; also Fig. 427). It sometimes happens that a very much dilated vein ruptures, causing extensive hemorrhage.

The treatment of varicose veins requires, above all, the removal of the cause. If constipation be present, it must be relieved. The affected leg should be kept at rest, propped in a horizontal position to favor the return flow of blood. If ulcers are present, they require special treatment (see **ULCER OF THE LEG**). To avoid, as much as possible, congestion of blood in the veins of the leg, they may be carefully bandaged, from the toes to the thighs, before rising. Rubber stockings are not well borne by some patients. Rest in bed, and an elevated position of the leg, are necessary in the treatment of obstinate ulcers with painful varices. Operative removal of the entire dilated vein, with its branches, usually leads to a rapid cure of the ulcers, and to relief from all other disturbances.

VARIOLA (SMALLPOX).—An acute, infectious, febrile disease, accompanied by a pustular eruption. The disease—called *smallpox* in contradistinction to *grand-pox*, or syphilis—has been known from the most ancient times. It is thought to have been introduced into Europe from Asia in 180 C. E., during the reign of Emperor Marcus Aurelius. At that period the disease was known as the “long plague.” Then, as well as later, the malady desolated every place it visited, as it attacked (as it still attacks) every one who, unprotected, exposed himself to contagion. A person who has recovered from smallpox is, as a rule, immune to a second attack as long as he lives. In this respect smallpox resembles a number of other diseases, such as measles, scarlet fever, etc. In former times, the malady was known also as “infantile pox,” because it was largely a disease of children, adults being usually immune, having had the disease during childhood. Beginning with the introduction of **VACCINATION** (which see) in 1796, and in proportion to the extent to which this preventive measure has been employed, this scourge of mankind has gradually lost most of its terrors.

The mode of infection in smallpox is unknown. Inhalation of the contagium may be responsible. After infection, in a non-immune, a prodromic

period of from 10 to 12 days constitutes the so-called *incubation period*. Then, in most cases suddenly, an extremely violent fever sets in, which lasts four days and is accompanied by extremely severe backache and pain in the limbs, headache, vomiting, and delirium; in some cases a red eruption, resembling scarlatina, appears at this time, mostly on the abdomen. Some patients die during this period of fever, as a result of severe infection. On the third or fourth day of the active stage of the disease, the eruption appears. At first it occurs on the face, and later breaks out over the entire body, the fever subsiding at the same time.

The eruption at first consists of reddish spots, closely resembling measles. The spots soon become hard, feeling like shot beneath the skin, and then

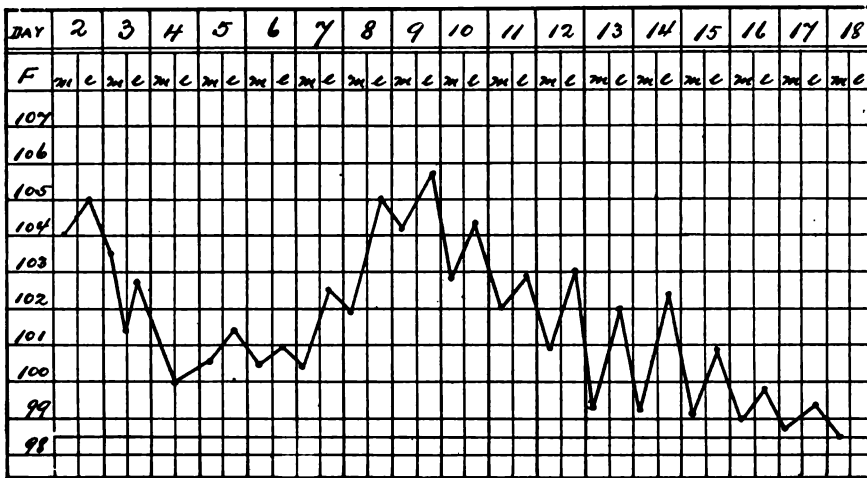


FIG. 429. Temperature-curve in smallpox, showing primary and secondary fevers.

minute vesicles appear. These vesicles, becoming infected by the bacteria normally present in the skin, become pustular. The pustules may remain separated, or they may be so close together that the entire skin is covered by their disfiguring presence. Following the eruption, the fever usually subsides for a few days, and is then followed by a new rise in temperature, the so-called *suppurative fever*. This fever, which is due to the pus in the pustules, lasts about 10 to 11 days. During this period of very severe suffering, the entire body—the skin, the mucous membranes, the eyes, the ears, even the throat and the sexual organs—may be covered with pustules. The intestines, kidneys, and joints may be affected also.

After the suppurative stage of the disease, the fever and the inflammation subside. The pustules dry and form crusts which fall off about 35 to 40 days after infection took place, usually leaving disfiguring scars. A great many patients succumb during the second period of fever. They die with symptoms of delirium, or from weakness of the heart; or occasionally they choke because of intense local inflammation. Some patients become deaf

or blind; some remain crippled; others are paralyzed; and still others become so debilitated that they later succumb to the slightest affection. The accompanying illustration (Fig. 430) shows a mild case of smallpox at the beginning of the suppurative stage. It is more than probable that the patient will recover, but his face will show many disfiguring scars.

Black smallpox, or bleeding smallpox, is the name applied to an extremely severe form of the disease. This runs a very rapid course, and is always fatal. The symptoms are especially severe in cases where the pustules develop in great profusion; whereas cases in which the pustules remain more widely separated are apt to run a milder course.



FIG. 430. Eruption of smallpox.

Before the introduction of vaccination, only children were attacked by smallpox. At present the disease affects chiefly adults, in whom the immunity obtained by vaccination during childhood has run out because they have neglected to have themselves revaccinated. Such cases, however, run a much milder course than in persons who have never been vaccinated. It is self-evident that unvaccinated children are subject to the severe forms of the disease. If smallpox ever affects the vaccinated,—which it does occasionally, for the immunity is relative, not absolute—the disease almost invariably runs a very mild course. There may be slight fever for 3 or 4 days, without eruption; or an eruption

may occur which is very scant, and not apt to be disfiguring. For facts concerning the length of time of immunity, and the needs for revaccination, consult the article on VACCINATION.

Patients affected by smallpox at once feel so sick, and the symptoms are so severe, that medical assistance is probably called at the beginning of the disease in every instance. Coolness, rest, subdued light, pure air, cooling beverages, and washing of the mouth are the first requirements, in addition to lukewarm ablutions. If no physician be present, the friends or relatives of the patient should at once notify the board of health; for only when the authorities are informed in time will it be possible for them to counteract a spread of the affection, and to do what is necessary to protect the patient's surroundings. To hide a case of smallpox from the knowledge of the authorities is a very serious crime.

VASELINE (PETROLATUM).—A distillation product of petroleum. It is a yellowish, transparent substance, of the consistency of lard, and having a faint odor of petroleum. It is used as a bland dressing in the case of mild burns or other local inflammations of no special significance, and as a basis for ointments. In the form of pills it is sometimes used in chronic diseases of the respiratory apparatus. The liquid vaseline is of value as a local application to inflamed mucous membranes of the mouth, nose, throat, etc.

VEGETABLES.—In the scientific sense all plants are vegetables; but in the usual meaning, the term embraces only such herbs, or parts of herbs, as are used for food. Such food vegetables may be divided into three principal groups: (1) *Root vegetables* (potatoes, turnips, beets, onions, carrots, parsnips, radishes, etc.); (2) *leaf vegetables* (cabbage, spinach, lettuce, sorrel, parsley, etc.); and (3) *fruit vegetables* (legumes, corn, pumpkins, tomatoes, cucumbers, etc.). In the last-named group may be included also blossom vegetables, such as artichokes, cauliflower, etc.

All vegetables contain a large amount of water, and an abundance of salts and aromatic substances, some of which are essential aids to the digestion. On the other hand, they contain only relatively small amounts of nutritive material. Nevertheless, vegetables are of the greatest importance as contributing to the necessary variety of the food, and as stimulating the appetite by appealing to the senses of taste and smell. Moreover, the salts which they contain are indispensable for the structure and normal activity of the various organs. Because of their bulk, vegetables are of value also in allaying hunger, thus furnishing an essential addition to more nourishing, but less filling dishes.

Since the value of many vegetables partly depends upon the nutritive salts which they supply to the body, it is necessary to see to it that this valuable quality be not lost in cooking. One should not go to ridiculous lengths in this matter, however. Above all, vegetables should be carefully cleaned. This is of the utmost importance, as many vegetables, through manure, may be contaminated with the eggs of intestinal worms. As a rule, vegetables should be cooked only in that amount of water in which they are to be served. The water in which such vegetables as asparagus or cauliflower have been cooked, may advantageously be utilized in soups. To cook vegetables by steaming is advisable; whereas the vegetarian method of mincing them, and then stewing them in fat, is not suitable for all stomachs. Moreover, a disagreeable taste of iron is imparted to vegetables by mincing. See also the articles on **FOODSTUFFS** and **VEGETARIANISM**.

VEGETARIANISM.—A theory advocating an exclusively vegetable diet. In all parts of the civilized world, there exist groups of men who consider vegetables the only proper food for mankind, and who call themselves vegetarians. The propaganda for this exclusive form of nourishment has been carried on with more or less enthusiasm for ages; but in spite of the hearty

recommendations accorded it by a few philosophers and other men of mental superiority, it has never found favor with the masses. Within recent years the question has been made the subject of scientific investigation. It has been demonstrated that the weight of the body may remain stationary, and the need for proteids be satisfied, on a diet consisting of uncooked vegetables exclusively. Most so-called vegetarians, however, do not remain loyal to their principle of taking no animal food, since their dietary includes such articles as milk, cheese, butter, eggs, etc.

The characteristic feature of a vegetable diet is the limited amount of albumin ingested (2 to 2½ ounces a day, as compared with 3 to 4 ounces on a meat diet). This deficiency is largely compensated for by the increased amount of fatty elements (oils, nuts, etc.) consumed by vegetarians. On a vegetable diet, nutrition is carried on at the lowest possible level, so that the general economy is always slightly endangered. The majority of vegetarians are below the average with regard to nutrition and weight, and are usually thin and anemic. In spite of this circumstance, however, they remain healthy, chiefly on account of their regular mode of living, their avoidance of excesses in drinking alcoholic beverages, and their strict observance of bodily hygiene (taking plenty of exercise, fresh air, sleep, etc.). This is one explanation of the fact that many vegetarians keep well in spite of scanty nourishment.

Within recent years careful dietary studies have been made by a number of chemists, notably Chittenden, Atwater, Benedict, and others. Chittenden has shown that people eat too much meat, and that a restriction in the proteid of the food is advisable. On the other hand, many dietary studies show that eating, like every other natural act, is in process of evolution, and that man's needs are gaged by his appetite better than by the chemist's balance. Careful dietary studies in Japan have shown that the Japanese have been underfed for years in proteids, and that the introduction of a fuller meat diet has done away with certain diseases, notably beriberi in the navy. The most important and powerful peoples have always had a more ample diet; and poverty, and the consequent reduction of food supply, is one of the most important elements in racial deterioration.

For medical purposes, a vegetarian diet is an entirely different matter. The majority of vegetarians adopt this mode of nourishment during some sickness when, despairing of being cured, they resort to extreme dietary measures, as if faulty nourishment were the only source of disease. In a small number of diseases a vegetable diet actually results, directly or indirectly, in a cure; as, for instance, in stubborn constipation. Excluding meat from the diet is often beneficial in gouty conditions, in insidious kidney troubles, and in certain skin-diseases. The question as to the advisability of a vegetable diet in any given case, can be answered only by a physician, as it depends upon an exact knowledge of the causes of the existing disease.

If such a diet be recommended, however, it should always be modified by the addition of milk or milk products, in order to avoid the consequences of deficient nourishment. This modification is not necessary in the case of obesity, in which disease a vegetarian diet—carried out under the supervision of a physician—is often productive of excellent results.

VEINS, INFLAMMATION OF.—An inflammation of some part of the body may occasionally affect the adjacent blood-vessels (veins), causing inflammation of their walls. A vein thus affected becomes swollen and painful, and feels like a hard cord beneath the tissues. In consequence of such inflammation of the wall of a vein, the blood coagulates in the affected part, and causes an obstruction (see Plate VI., Fig. 2). The bacteria causing the inflammation may invade this blood-clot, and convert it into pus. By this means it may become liquefied, and may be carried away with the blood-stream to other parts of the body, where it may cause inflammation and suppuration in other veins. If a solid blood-clot breaks loose, it may be carried to the heart or to the lungs, and obstruct important arteries, thus causing death (see **EMBOLISM**). For this reason inflammation of the veins is a very dangerous condition, and necessitates careful treatment. The most essential part of the treatment consists in giving the affected part of the body absolute rest.

VENEREAL DISEASE (SYPHILIS).—A remarkably wide-spread, contagious disease, which is generally transmitted through uncleanly sexual intercourse. Contagion may, however, occur from other than sexual contact; for instance, by kissing, or by using articles (glasses, dishes, etc.) that have been used by a syphilitic person. This may happen when a person who has the smallest wound or abrasion on the skin or on a mucous membrane comes in contact with the secretions of a person having active syphilis. Contagion takes place only if the exposed person has been free from syphilis; for whoever has had the disease remains, almost without exception, immune for the balance of his days. Another, and unfortunately very frequent manner of contagion, is by inheritance, from either parent or from both. This fact is of great social significance, for the offspring of syphilitic parents frequently die in the womb, and the living ones (as a rule prematurely born) can rarely be kept alive. Those who are saved develop poorly, and are badly equipped for life's struggle; they are backward in mind and body, lead a miserable existence, and are a burden to themselves and to others.

The onset of syphilis is, almost without exception, marked by the appearance of a so-called chancre, a more or less compact, nodular swelling of tissue (the size of a bean), occurring at the part where the first contact with the syphilitic poison took place. On account of the usual, though not invariable, hardness of the tissue, it is spoken of as a *hard chancre*. This develops, as a rule, about 2 to 3 weeks after infection, sometimes in from 5 to 8

days, and marks the first stage in the development of the disease. On account of its painlessness and small size, the chancre may remain unobserved for some time, especially as some persons do not believe in the possibility of contagion after such a long interval. Later on, other symptoms appear, which, if studied carefully, soon point to the nature of the trouble. The lymphatic glands situated near the chancre begin to swell, usually without pain, and may attain considerable size. At the end of a further period of development (lasting 3 to 5 weeks), the virus has entered the blood, poisoning the entire body. This is the second stage of the disease, and is characterized by general disturbances, such as headache, rheumatic pains, mild febrile attacks, loss of hair, general swelling of the glands, and a rash on the skin and on the mucous membranes. This rash is of value in diagnosing the disease. However, as it may occur in various forms, and as it closely resembles eruptions that are not syphilitic, it can be recognized only by an experienced physician. A person who, conscious of having been exposed to the danger of contagion 6 to 10 weeks previously, notices small and large red spots on his chest and abdomen, or small scabs and crusts on his head, lips, and tongue, and on the mucous membrane of his cheeks, or swelling of the tonsils, pain on swallowing, or hoarseness, also loss of hair and swelling of the glands, had best put himself in the care of a physician who will diagnose his case and give the necessary treatment. Syphilis is a very slowly developing disease, and does not necessarily end with the disappearance of the above-mentioned symptoms. For several years after, milder or graver relapses may occur, until the end of 3 or 4 years; and in cases which received insufficient treatment, it may be 7 or 8 years before a subsidence of the symptoms takes place, which usually marks the end of the early stage of the disease.

The danger of syphilis lies in the late syphilitic accidents. These impair the tissues of the body, destroying them through degeneration, swelling, hardening, contraction, and scar-formation. After the symptoms of the first period have disappeared, a normal condition generally ensues. The later symptoms, however, not only menace the functional capacity of a single organ; but in some cases vital organs become affected, thus endangering the life of the patient. On account of the organic complications, syphilis terminates fatally in more cases than is commonly supposed. Quite often there results an additional incurable disease, such as tabes dorsalis or general paresis, which, although not threatening immediate danger, creates permanent disturbances, and makes life a burden. One need consider only the frequent deformities resulting from ulceration, falling in of the bridge of the nose, diseases of bones and joints, destruction of the soft and hard palates, etc. How often these late syphilitic symptoms may appear, can not be answered definitely. In the majority of cases, the end of the first period marks the end of the trouble, and the patient is cured; but if treatment was

delayed, or inadequate, in the first stage of the disease, these secondary symptoms are liable to occur. When treatment is undertaken methodically from the beginning, and kept up for a sufficiently long time, the patient rarely suffers from later developments.

It would seem to be of the greatest importance to find ways and means for arresting this dread disease, which is spreading more and more on account of modern social conditions, and also to diminish the danger of contagion for the individual. In this respect, general public provisions and personal precautions must be differentiated between. The fundamental features of a sensible campaign against syphilis (as against other sexual diseases) can only be briefly outlined in this article. The main thing would seem to be to make an end of all hypocrisy and prudery, and to judge things as they are. In this place it is necessary to regard sexual diseases, like all other contagious diseases, entirely from the standpoint of health. To consider them from a pseudo-moral standpoint would be narrow-minded and foolish, since it is contrary to all scientific facts to regard venereal disease as the natural punishment for sexual excesses. The public at large would have a better knowledge of the bearing of syphilis upon certain diseases, if there were a general public explanation of this matter. Only then will it be possible to properly teach and equip the young people about to enter upon life's path; and only then will there be a realization of the necessity for timely and thorough treatment, and for the hygienic regulation of prostitution.

Personal chastity is of course infallible. If this ideal can not be reached, individual precaution will profit greatly by a better and more wide-spread understanding of the conditions. Scrupulous cleanliness, washing the sexual parts both before and after coition, and the use of protectives known by the name of condoms, are advisable precautions.

The treatment of syphilis should be begun as early as possible. Great stress should be laid on the decided advantages derived from mercurial treatment, in spite of much prejudice on the part of the layman. It is true that this treatment (whether given by inunction, by injections, or internally) necessitates careful medical supervision, in order to prevent the appearance of certain unpleasant symptoms. But when this precaution is taken, the treatment is perfectly harmless; and it is absolutely indispensable for the disease in question. Other remedies and methods (such as iodides, bath treatments, etc.) are undoubtedly helpful, but by no means adequate. All qualified investigators of this subject are agreed that mercury is the only positive and reliable remedy in the treatment of syphilis. The disease in question being an extremely insidious one, it is necessary to repeat the treatment at certain given intervals. Experience teaches that in the majority of cases it is necessary to give 4 or 5 energetic treatments, covering a period of 2 to 3 years. Some observers recommend a renewed treatment after each

relapse, or recrudescence. It will always be best for the patient to allow the attending physician to determine the period as well as the mode of treatment, as each case is a law unto itself. In every form of mercury treatment, the patient must carry out certain general directions, in order to avoid unpleasant complications which would interfere with a thorough treatment. The care of the mouth and teeth is of great importance. The mouth should be washed several times a day and gargled with some antiseptic solution; the teeth and gums should be brushed with good tooth-powder, if possible after each meal; and whenever necessary the teeth should be examined and treated by a dentist. Alcohol should be prohibited during the treatment. Food which is acid, irritating, or indigestible must be avoided. The diet should consist of strengthening and easily digestible things. A healthful, sober way of living, plenty of sleep, moderate exercise in the fresh air, and good nourishment, are of the greatest importance in conjunction with a properly managed course of mercury treatment.

With regard to marriage, it may be said that a person who has had syphilis ought not to marry without first consulting a physician. The transmission of syphilitic infection from husband to wife occurs very frequently, even in cases where the former had reason to consider himself cured. The dangers attendant on infection of the wife (miscarriages, premature births, sick children) necessitate the greatest precaution in this respect. In most cases a person who has suffered from syphilis might be allowed to marry after having undergone a sufficiently long treatment, and if, during an interval of two years (during which time the patient is under observation), there are no further symptoms of the disease.

The fact should be emphasized, that syphilis is a disease which in most cases, if thoroughly and properly treated, can be permanently cured. Infection by contact or association is not probable after a certain period; and although there is no absolute guarantee against the possibility of subsequent syphilitic troubles, still, if the first treatment was thorough, it is very probable that this will not be the case. Only the physician can arrive at a decision in each individual case; but there are numerous examples of persons who, after having been thoroughly treated for syphilis, have married, and whose wives and children have remained perfectly healthy. Independently of the effect of treatment, experience shows that only a minority of syphilitic persons suffer from the secondary symptoms of the disease. After careful consideration of these conditions, the pessimistic opinion of some persons who regard syphilis as an incurable disease is without justification.

The public should be warned against the advertisements of charlatans who take advantage of the desperate mental condition of syphilitic patients. The dangers of faulty diagnosis, and of unscientific and inadequate treatment, are very grave. Persons suffering from venereal disease should avoid

reading popular, and even supposedly scientific medical books. Misconceptions usually result; and many a fairly harmless disease is aggravated by imaginary fear, and the resultant mental depression.

VENTRILOQUISM.—The art of speaking in such a manner that the sounds seem to come from some person other than the speaker. By strongly compressing the vocal cords, by bringing the epiglottis down over the opening to the larynx, and by moving the lips so slightly as to be almost imperceptible, adepts in this art are able to simulate voices which apparently come from a distance. Long ago the belief was current, that the voice actually proceeded from the interior of the abdomen; and it was popularly supposed that a demon which inhabited the abdominal cavity gave vent to the sounds. Hence the name: *ventri*, "belly," + *locutio*, "speaking." The average itinerant ventriloquist, as a rule, merely changes his voice by altering the character of its pitch, at the same time directing the attention of his audience to some puppets which he manipulates, thereby aiding the illusion. The true ventriloquist, however, needs no accessories. He can apparently cause a strange voice to proceed from some other part of the room, from the street, or from the cellar. The art of ventriloquism may be mastered by taking respiratory exercises. One must inhale deeply, allow the breath to escape very slowly, and control it with the laryngeal muscles and with the muscles of the palate, moving the lips as little as possible.

VERATRUM.—The American green hellebore, or swamp-hellebore (*Veratrum viride*). The rhizome and rootlets are utilized in medicine, as they contain a number of powerful alkaloids, the two most important of which are *jervin* and *veratroidin*. These two alkaloids have quite distinct actions on the body. The most noticeable effect from a moderate dose, and that for which the drug is usually employed, is a slowing and softening of the pulse. Both alkaloids contribute to this result, the *jervin* acting on the heart itself, and indirectly on the blood-vessels, while the *veratroidin* acts on the nervous mechanism controlling the heart. The lowering of the arterial pressure is usually accompanied by more or less sweating, and by a reduction of temperature. After a large dose the pulse finally becomes weak and rapid, and there is marked muscular prostration, incessant retching and vomiting, faintness and vertigo, perhaps going on to unconsciousness and death. Water should be given freely until the patient's stomach is thoroughly washed out. His head should be kept low, and he should be stimulated. External heat should be applied. *Veratrum viride* is used when it is desired to lessen the blood-pressure, as in the early stages of pneumonia, pleurisy, and in apoplexy. It is sometimes given in uremia and eclampsia, and in some forms of heart-disease when the heart is acting too vigorously. The fluid extract is given in doses of one to six drops.

VERONAL.—A white powder which acts very much like trional, but is said to be less deleterious. It is given in five or ten grain doses to produce

sleep. Its effect wears off after it has been used for a week or two. Long-continued usage may cause poisoning.

VERTEBRAL COLUMN, CURVATURE OF.—A condition which consists in a deflection of the vertebral column to one side. It is a frequent disease in very young children and in children between the ages of five and six. The deflection is accompanied by a turning of the vertebræ around their long axis, and with them of the ribs. In consequence of this, the ribs protrude abnormally on the convex side of the curvature, while they are

flattened on the other side. If the vertebral column is curved sideways only, it is called a curvature of the first degree. The second degree includes the axial deflection of the vertebræ. This deflection, as well as the curvature, may be somewhat corrected by pressure and by extension. When the vertebral column is absolutely inflexible, it is called a curvature of the third degree. The curvature may be simple or multiple, according to whether the deflection is in one portion of the vertebral column only (either to the right or to the left), or whether there are two or three curvatures. In a three-fold curvature, the lumbar portion may be deflected to the left, the thoracic portion to the right, and the upper thoracic and cervical portion again to the left (see Fig. 431).



FIG. 431. Three-fold curvature of the vertebral column.

A frequent cause of lateral curvature of the spine in school-children, is the incorrect position they assume when writing. Some children press the right side of the body forward against the table, and draw the left side back, at the same time elevating the right shoulder and lowering the left (Fig. 432). If attention be paid to it that the children assume a correct position when seated (Fig. 433), and if suitable places be provided for them to work at, this "getting crooked" would be averted. See illustrations under **EYE, CARE OF.**

In developed cases of curvature of the spine, only those of the first degree, and beginning cases of the second degree can be fully cured. Cases of the third degree are incurable; while severe cases of the second degree can be improved only. Early treatment enhances the patient's chances for a cure of spinal curvature. The fact, that in some schools the children are examined by a physician in order to determine the possibility of an existing

curvature of the spine, is a step in the right direction. Slight degrees of curvature are often overlooked by the parents. The treatment consists of massage, orthopedic gymnastics, exercises with medico-mechanical apparatus, and the wearing of corsets made of special materials (plaster of Paris



FIG. 432. Harmful attitude when writing



FIG. 433. The proper attitude when writing.

or celluloid) and of supporting apparatus. The physician must determine which treatment best suits a given case.

VERTIGO.—A condition characterized by a seeming defect in the equilibrium of the body, and accompanied with more or less severe disturbances

of consciousness. This simple condition may be due to a variety of causes. Disturbances in the semicircular canals of the labyrinth of the ear—the organ of equilibrium—may be followed by sensations of dizziness. Anemia and, in some cases, congestion of the brain or parts of the brain, are other causes. The most frequent causes of vertigo are, undoubtedly, digestive disturbances, hunger, or want of sufficiently nourishing food. Certain diseases of the eye may likewise give rise to the affection.

Mental impressions, such as fear of falling from an elevation, are well-known causative factors in the production of nervous vertigo. The affection often follows upon changes in the smallest capillaries in the brain (as in consequence of arteriosclerosis), in some diseases of the heart, brain, and nerves, and during convalescence after severe illness. Vertigo is a peculiar accompaniment of Menière's disease. See DEAFNESS.

Treatment varies according to the cause of the disorder, and it is therefore advisable to consult a physician in time. In cases of vertigo resulting from stomach affections, the first requisite is to empty the stomach of its contents. A powerful emetic will work wonders. Suitable food, and correct regulation of meals may solve the difficulty in some cases. In cases of vertigo caused by disturbances of the eyes, the oculist must be consulted; in some cases correct glasses will afford immediate relief. Vertigo resulting from anemia of the brain (especially an individual attack of vertigo) is relieved most rapidly and surely by means of Nāgeli's method as described in the article on HEADACHE.

VIVISECTION.—The dissection of a living animal for purposes of scientific experimentation and observation. To this study is due the vast mass of knowledge of the most important phenomena of life: the circulation of the blood, the function of the nerves, etc., etc. The efficacy of medicines is established by trying them on animals; and operations may be performed on animals before they are undertaken on human patients. By experiments on animals, knowledge may be obtained about the communicability of certain contagious diseases, and of diseases caused by parasites; and the theories of prevention and cure are often based on such experiments. A great deal has been learned, but much still remains to be solved; and so long as this is the case, vivisection will remain an indispensable aid to the investigator. This makes it all the more remarkable that certain people try to abolish vivisection by all means, no matter how objectionable, announcing their aim to be "the preservation of animals from needless torture." Such phrases as "murder for the sake of science," "scientific animal torture," etc., are frequently used by persons who have never seen experiments made on animals, and who have not the slightest idea of the value of these investigations. It will never be possible to convince these fanatics, for they do not wish to be convinced. The impartial person, however, will recognize from the short account here given, that vivisectional experiments are

necessary. Sensitive persons may take comfort in the fact, that the animals are usually given an anesthetic before the experiment, so that they feel no pain. The revolt against vivisection is therefore totally groundless.

VOCAL CORDS, PARALYSIS OF.—The vocal cords may become paralyzed owing to pathological changes in the nerves and muscles of the larynx, or to nervousness (hysteria). Goiter, cancer of the esophagus, aneurisms of the aorta, etc., are frequent causes of unilateral or of bilateral paralysis of the vocal cords. The former condition is generally characterized by

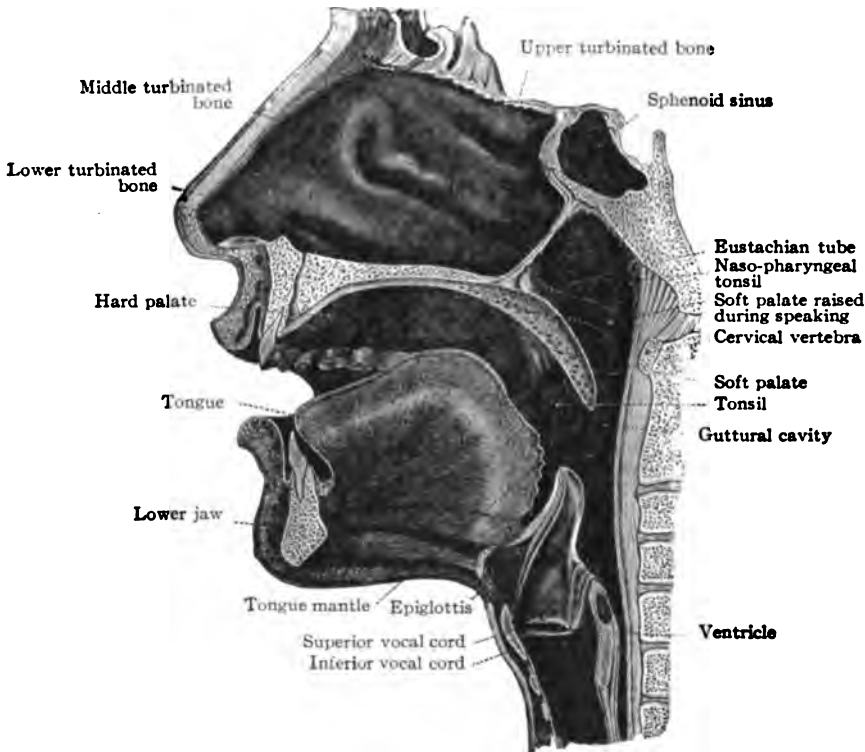


FIG. 434. Longitudinal section of the head.

continuous painless hoarseness. In cases of bilateral paralysis, there is either dyspnoea (difficult breathing) or aphonia (loss of voice). The latter symptom is generally of nervous origin, and is easily cured. Paralysis of the vocal cords, when not due to nervousness, may subside, but usually remains for life. A slight degree of paralysis, or weakness, of the vocal cords may result from overexertion. In addition to local treatment, this condition calls for measures tending to strengthen the general constitution, and for vocal exercises.

VOICE AND SPEECH.—The human voice is produced by the combined action of all the muscles of the respiratory apparatus. With more or less force, the air expelled from the lungs acts upon the true vocal cords situated

in the larynx, and these cords are kept in a certain state of tension by the action of the laryngeal muscles. The glottis, or space between the vocal cords, is contracted or dilated by the muscles of the larynx, thus determining the pitch of the sounds produced by the vibrations of the cords. The sounds are finally modified by the tongue, palate, teeth, lips, etc., whereby the several variations necessary for the formation of intelligible speech are brought about. The strength of the voice varies according to the force with which the air is expelled from the lungs; and the pitch, as already mentioned, depends on the degree to which the glottis has been contracted, as well as on the rapidity of the vibrations of the vocal cords.

The accompanying illustration (Fig. 434) represents the right half of the human head, cut longitudinally through the middle. It shows the oral cavity with lips, teeth, and tongue, closed above by the hard palate, to the back of which are attached the soft palate and the uvula. When the mouth is opened wide, and the sound "ah" is produced, the soft palate will be seen to shoot upward; on ceasing, it again recedes. The illustration shows a side-view of this. The soft palate must be raised in the production of any sound except the nasal ones (m,n,ng) which, as the name indicates, are produced through the nose. If the soft palate were raised when these sounds are spoken, it would obstruct the posterior nares. A person who speaks without the soft palate being raised, is said to speak with a twang.

The lips, teeth, palate, etc., change the laryngeal sounds into vocal sounds. If the mouth be opened so that the laryngeal sound issues almost unchanged, the vowel "a" (as in "arm") is heard; if the lips be brought closer together, and rounded, the sound changes to "o." If the lips be closed still more, the sound of "oo" (as in "fool") results (see Plates XXI. and XXII.). Consonants are formed in three ways: (1) with the lips and teeth (b, p, etc.); (2) with the teeth and the point of the tongue (d, t, etc.); and (3) between the back of the tongue and the palate (g, k, etc.).

From the foregoing it may be seen that the process of speech is extremely complicated. Innumerable muscles are connected with it; and these must be properly controlled so as not to create disturbances. This control is exercised by the so-called word-forming center in the brain, in which, from a certain given point, the entire external speaking-apparatus and all its functions are cared for. As one learns to speak essentially by the ear, so there is another brain-center of speech, called the auditory speech-center, or the center of word-understanding. Speech-disturbances may result from injury to either the external organs of speech or to the brain-centers. If the center of word-formation be injured, as after a paralytic stroke, the person loses the ability to form words, and becomes dumb. If the center of word-understanding be injured, the person, though able to hear, does not understand what is said (word-deafness). See also the article on **SPEECH DISTURBANCES**.

VOICE, CARE OF.—The care of the voice is of great importance in some callings, and has an educational and artistic value for all persons. Children should be taught good enunciation, accentuation, and rhythm as early as possible. Much screaming gives rise to nodules in the vocal cords, which lead to lasting hoarseness. Faulty consonant-formation, as well as palatal or nasal pronunciation, is much more easily improved in children than in adults. Much reading and singing may cause overexertion of the delicate voice of a child. Unfortunately, there is no general public voice-culture; and the teachers in the schools are not versed in speech-technique. Nor are teachers, military officers, preachers, etc., properly prepared in the technique of voice and speech needful for their respective callings. Most of these attain a certain degree of perfection by practise and imitation; others, less clever, may suffer seriously from fatigue, and even total loss of voice. On the appearance of the first symptoms, they should rest their voices; and afterwards take a course of instruction in proper speaking.

VOLATILE OILS.—See OILS, VOLATILE.

VOLVULUS.—See INTESTINES, DISEASES OF.

VOMITING.—The act of ejecting, through the mouth, matter which has been regurgitated from the stomach. It consists in the sudden violent reversal of the normal act of swallowing and of the movements of the stomach. Vomiting may result from a vast variety of causes, some of which (as the smell of putrid flesh) are very slight; while others may be indicative of severe injury to the centers of vomiting in the brain or medulla. Among nervous causes of vomiting may be mentioned: Thoughts and ideas (disgust), certain motions (seasickness), and affections of remote organs (the uterus, for instance) which, by reflex action, influence the center of vomiting.

Vomiting is frequently the result of the body's own efforts to rid the stomach of harmful substances. In such a case it is advisable to aid nature by promoting the act. Frequently, however, vomiting persists for a long time, without being beneficial to the body. The nervous vomiting of hysterical persons, and of pregnant women, may be so persistent and tormenting as to cause the patients grave loss of strength.

Simple remedies may often stop vomiting. Sucking small pieces of ice, for instance, is frequently efficacious. The application of an ice-bag to the region of the stomach serves the same end. Fasting for some time is likewise of service. A simple treatment for nervous vomiting consists in manipulation of the hyoid bone, according to Nāgeli's method.

The hyoid bone, a delicate U-shaped bone, is situated above the larynx in the fold of the throat, at the base of the tongue. By passing the tips of both thumbs upward, one on each side of the larynx, the large horns of the hyoid will be felt at the junction of chin and throat. A few swinging movements will prove that the fingers actually grasp the hyoid bone. The manipulation is performed by grasping below the hyoid bone—either at the

lateral horns or along the center,—and then gently but vigorously pushing the head upward. Pressure backward, toward the vertebral column, must be carefully avoided. The manipulation should preferably be made from behind, as shown in Fig. 435; and the middle fingers and ring-fingers may suitably be used for raising the bone.



FIG. 435. Nägeli's manipulation of the hyoid bone to relieve vomiting.

The person performing the manipulation should keep the head in the raised position for from 60 to 90 seconds (by the watch) without yielding. He should vigorously oppose any retching movements, and should wait until the patient declares that his tendency to vomit has disappeared. The manipulation may be repeated as often as necessary. If correctly done, it is the safest and surest remedy for all forms of nausea, especially for the vomiting of

hysteria and of pregnancy, as well as for vomiting following the administration of chloroform. It is efficacious also in abdominal inflammations. In fact, it may serve to restrict excessive vomiting even in incurable affections.

W

WARBURG'S TINCTURE.—A complex mixture which was devised by Dr. Warburg, the formula being kept a secret by him for many years. It was finally published, and the mixture has since then been largely used in tropical countries for severe malarial infection. It is a dark brown liquid, containing fourteen ingredients, the most active of which is quinin. Aside from malaria, it is recommended for acute nervous exhaustion and nervous prostration.

WARTS.—Small, spongy, cauliflower-like growths on the skin, having a peculiar fibrous root formation. They generally appear and disappear periodically, especially on children's hands, several dozens often occurring simultaneously. The fact that they disappear spontaneously after a certain length of time, has thrown a sort of mystery about them, so that if any hocus-pocus be used shortly before the time of their disappearance, the conjuration is believed to have worked wonders. Some warts undoubtedly result from contagion. Experiments have proved that they may be transmitted directly from one person's arm to another's.

Experience has demonstrated that there exists some sort of relation between warts and paper. The periodic appearance of warts in children usually begins at the time when they commence to go to school and use writing-paper, etc. It is remarkable also, how frequently warts appear on the hands of persons who handle old deeds, or in tellers who count a great deal of banknotes. Insignificant injuries to the hands, caused by tending plants, by embroidering, or by handling silk, plush, velvet, etc., are often the immediate cause of warts and blisters.

Local treatment alone is of service in removing warts. Internal remedies belong to the same category as charms:—if the treatment is given at the time of the regular disappearance of the warts, the effect is magical; at other times the “treatment” is fruitless. Warts may be removed by cauterizing or by cutting. Fuming nitric acid is often used as a caustic, a few drops being applied to the wart with a match several times a day. By local anesthesia of the surrounding area, warts may be removed painlessly by means of the surgeon’s knife.

WATER-BLEBS.—See PEMPHIGUS.

WATER AND DRINKING OF WATER.—Sixty per cent., or more, of the weight of the human body is made up of water; and this quantity must be maintained by a large daily consumption, in order to preserve good health. Drinking-water should be absolutely pure, or it may become a menace to health. Water from deep cisterns or from wells is better than water from lakes or rivers, because the latter becomes warm in summer, and tastes badly.

Water is often contaminated by human evacuations, and by drainage from dwellings, stables, factories, etc. Contaminations with disease-producing micro-organisms, or with the eggs of intestinal parasites (tapeworms, for instance) are of the greatest importance. Bacteria are found in water of every kind, chiefly in that of cisterns, lakes, and rivers. Although most of these bacteria are harmless, there are others that may cause severe diseases and epidemics. The most frequent of these pathogenic bacteria are the typhoid-bacillus (found chiefly in cisterns), the cholera-spirillum, and the bacterium of dysentery. Impure water should, therefore, be used neither for drinking nor for cleaning purposes. When typhoid or some similar disease is prevalent, the best safeguard is to drink only water which has been boiled. A few drops of lemon-juice added to such boiled water will counteract its flat taste. Owners of cisterns ought to have the water chemically examined at regular intervals.

Half a century ago the systematic drinking of spring-water was extensively used as a method of treatment. At the present time, this idea of water as a “cure-all” has been discarded. Similar experiences of recent years (such as the Kneipp water-cure) have likewise vanished and been forgotten. Scientific water-treatment (hydrotherapeutics), however, still remains in

use, and is bound to so remain, supported and developed by the medical fraternity.

The action of water is threefold: mechanical, chemical, and thermal. The mechanical action is due to the weight and volume of water, by which it distends the stomach, the intestine, the urinary bladder, and the gall-bladder. This stimulates the muscular movements of these organs, and promotes the passage of their contents. Water also softens the intestinal contents, and aids in the movements of the bowels. Small stones in the

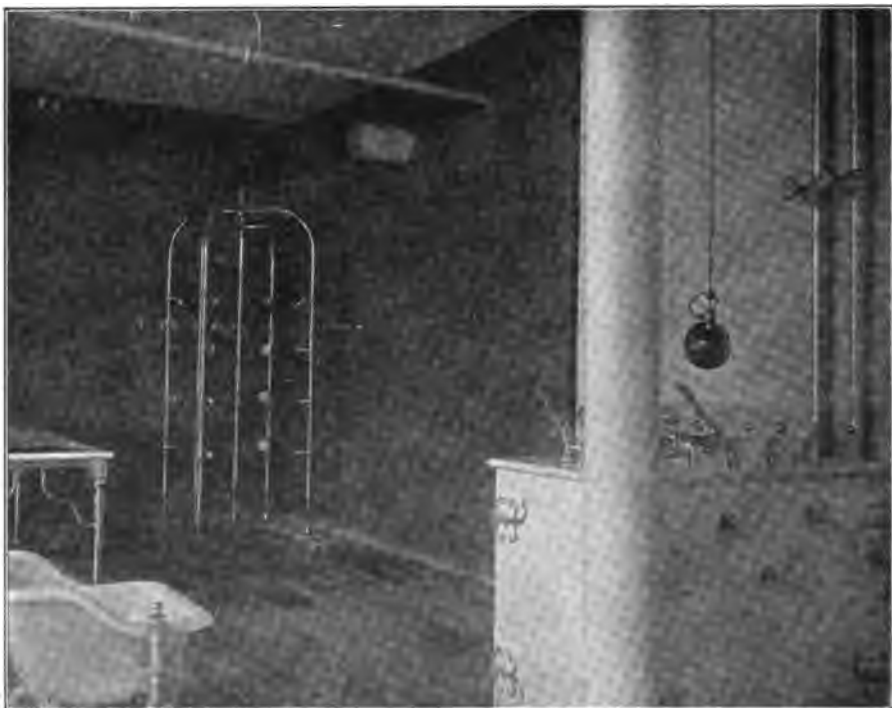


FIG. 436. Hydrotherapeutic apparatus in a modern sanitarium.

gall-bladder, gravel or sand in the pelvis of the kidney, and hard fecal masses in the intestine, may be carried along mechanically by drinking large quantities of water. The chemical action is due to the solution by water of certain injurious substances circulating in the body, as in gout and rheumatism. The excretion of uric acid is increased by the ingestion of large quantities of water at regular intervals. Cold water, either drunk or given in enemas, stimulates the intestinal canal, and furthers the evacuation of feces. It also reduces the pulse, and lowers the temperature of the body. For this reason, persons suffering from fever may drink cold water to advantage.

WATER-TREATMENT (HYDROTHERAPEUTICS).—The method of treating patients by means of water is as old as mankind. Accounts of

cures effected by this means have been handed down from antiquity. The Greek physician Hippocrates (400 B.C.) recommended hydrotherapeutics in cases of paralysis and rheumatism, by means of douches and rubbings. Cold-water treatment was recommended also by the Roman physician Celsus, who died shortly before the birth of Christ. In the middle ages the care of the body was sadly neglected; but in the seventeenth century hydrotherapeutics was revived by Floyer, an English physician; and in the following century the physicians Hoffmann and Hahn strongly recommended its use in Germany. Preisnitz, a layman, merely won the distinction of founding the first hydrotherapeutic institute. His mode of treatment was very one-sided, very energetic, and very unscientific. During the last fifty or sixty years, many improved hydrotherapeutic institutes have been founded the world over, following the general plan adopted by Preisnitz. At one time it was thought that only cold water could be used; and the essential feature was considered to be—"the colder, the better." Physicians, however, began to notice that not all patients could stand this method of treatment. Bad results were frequent; and the institutes in charge of educated physicians soon began to break away from the one-sided method. Efforts were made to treat each patient according to his particular complaint; and those for whom cold water proved harmful, were treated with lukewarm or warm water. The name "Cold-Water Institute" was gradually dropped. At the present time there are probably no institutes of the old type in existence, their place having been taken by the



FIG. 437. Affusion of the legs.



FIG. 438. Affusion of the back.

so-called "sanitariums," in which every known remedy is used, in addition to hydrotherapeutic measures (see Fig. 436).

Local applications of water have been recognized as remedial measures since times immemorial. Cold water is invariably used, which, by irritating the nerves of the skin, acts stimulatingly upon the blood-vessels, as well as upon internal organs. Cold affusions are useful in reviving persons who have fainted, or who have become unconscious owing to alcohol-poisoning or other causes. By dashing cold water in the face of such patients, it is often possible to make them regain consciousness rapidly. In the presence of mucous obstructions in the lung (as in bronchitis), cold affusions over the neck and shoulders are often of service in stimulating respiration. Their efficiency is increased if the patient is sitting in a warm bath while the cold water is being poured over him. In tuberculosis of the lungs, ere the disease has advanced too far, cold affusions of the entire body may be of service. It is best to begin with lukewarm water, gradually

letting it become colder and colder. The patient must go to bed afterwards; or, if the weather be warm, he may take a walk in the sun.

Affusions of different parts of the body are very frequently used. They are best given by means of a rubber hose attached to a faucet, through which the temperature of the water may be regulated. An ewer or other vessel can, of course, be utilized. The patient should stand in a shallow basin or bath-tub while the water is being poured over him.



FIG. 439. Affusion of the body in front.

The arm is sprinkled in the direction from the hand up to the shoulder. Only cold water is used. This measure is indicated in obstinate bronchitis, in congestion of blood to the head, and in neuralgic pains in the arms.

Affusion of the legs is given on both sides, beginning on the back side. The legs are sprinkled from the heel up to the buttocks, whereupon the patient turns around and is similarly doused in front (see Fig. 437). Cold water is to be used, and the entire proceeding must be done quickly. The patient is then dried, whereupon he may take a walk, perform gymnastic exercises, or go to bed, according to his condition. This measure tends

to divert blood from the upper parts of the body, and is therefore useful in congestion of blood to the head or chest, in cold feet, and in vertigo.

Affusion of the entire body must be given with care. All parts, except the head, are sprinkled; first the back, then the front. The body is sprinkled in the direction from the feet up (see Figs. 438, 439). This procedure must not be resorted to in cases of cardiac, pulmonary, or cerebral disturbances; nor in anemia and calcification of blood-vessels. The patient must be thoroughly dried and rubbed after the douche, whereupon he may take a walk or a rest in bed. This procedure is indicated in nervousness, in functional skin disturbances, and for the general hardening of the body.



FIG. 440. Affusion of the knees

The knees are sprinkled by pouring water from the feet upwards to a point immediately above the kneecap (see Fig. 440). The water should be cold. After rubbing and drying, the patient may walk or indulge in gymnastic exercises. This affusion serves to divert blood from the head.



FIG. 441. Affusion of the neck.

Affusion of the neck is given as indicated in Fig. 441. The patient occupies a stooping posture over the tub, resting on his hands. Cold water is poured over the neck, the shoulders, the arms, and the upper part of the back. This affusion may conveniently be given while the patient is taking a half-bath (see p. 165) of a temperature of 95° F. In that case the colder water should have a temperature of 60° to 75° F., and the chest should be included in the affusion process. Care must be exercised. This procedure is indicated in insidious lung affections, in congestion to the head, and for hardening the body.

WENS.—Small collections of fat beneath the skin. They are called also *sebaceous cysts*, and are usually hemispherical, hard or elastic nodes. Their size varies between that of a pea and that of a walnut (rarely that of a fist), and they are covered by smooth or hairy skin. If located on the head, the hair of the skin covering them may fall off. Sebaceous cysts may become inflamed; hence they should always be treated surgically. Their removal entails but a slight operation.

WETTING THE BED.—See **ENURESIS**.

WHITE PLAGUE.—See **TUBERCULOSIS OF THE LUNGS**.

WHITLOW.—See **RUNROUND**.

WHOOPIING-COUGH.—A highly infectious disease, principally affecting children, and characterized by spasmodic attacks of coughing, usually unaccompanied by fever. Different stages of the disease may be noted. During the first period there may be a slight bronchitis, with its ordinary temperature course, etc. This usually persists for from eight to twelve days and is then followed by the second stage—the spasmodic cough. Third comes the period of abatement. Whooping-cough is an extremely obstinate affection. The so-called “whoop” is the sound produced by the deep inspiration which follows the long, spasmodic expirations.

The course of the affection is extremely long. The lightest attacks are apt to last 6 or 8 weeks; and the more severe ones may persist for several months. Bronchitis and bronchopneumonia are frequent and dangerous complications of whooping-cough; and the loss of food that follows the constant spasmodic coughing runs the little patients down very materially. Most children recover, but remain tender for a long period of time. Particular caution is necessary to guard against infection by tuberculosis at this time.

The number of remedies claimed to cure whooping-cough, is countless—a proof of their inefficiency. Change of climate, applications of water, inhalations, local treatment of the mucous membrane of the larynx, and remedies tending to diminish the irritation, are the only means at the physician's disposal. Care should be taken to let the patients stay in the fresh air whenever the weather permits. Bedrooms and living-rooms should be frequently and thoroughly ventilated. The food should be nourishing and readily digestible; and the meals should be small but frequent. It is advisable to feed the patient after each attack. Dry and crumbly foods should be avoided, as they are liable to cause attacks of cough, with the attendant vomiting. A change of climate occasionally exerts a favorable influence. Care should be taken, however, that the disease be not transmitted to localities that are free from this affection; and for this reason it is best to take the little patients to lonely farm-houses or similar places.

Weakly children, particularly those affected with tuberculosis, should be especially protected during an epidemic of whooping-cough. At the outbreak

of an epidemic, it is advisable to remove such children to another locality, or to keep them strictly isolated at home.

WICH-HAZEL.—See **HAMAMELIS.**

WIDAL TEST, THE.—It is sometimes very difficult to determine in a given case whether the patient is suffering from typhoid fever or from one of a large number of other diseases that frequently resemble it very closely, at least during the earlier stage of the illness. In the second week or later there is usually no great difficulty in determining whether or not the case is one of typhoid fever, but during the first week or so the symptoms may be identical with those produced by influenza, tuberculosis, meningitis, malaria, pneumonia, appendicitis, and other conditions; thus making it difficult to arrive at the correct diagnosis. Typhoid fever may begin in so many different ways, and is so often irregular in its early manifestations, that physicians for years endeavored to discover some certain means of recognizing it, but in spite of all their efforts until quite recently occasional mistakes were unavoidable. Now, however, thanks to the progress that has been made in bacteriology, the diagnosis of typhoid fever can be made with almost absolute certainty. While the principle underlying this test, which is called the *Widal test* in honor of the French physician who did most to make it a routine procedure, is not very difficult to understand, it requires a certain amount of practise and experience to carry it out in such a way as to make it a reliable source of information.

The test depends on the fact that, when animals or human beings are inoculated with the bacteria or germs of certain diseases, peculiar changes take place in the blood. For example, when typhoid-bacilli are allowed to grow in beef broth they swim about very actively, and if a drop of the fluid is examined under a powerful microscope the separate germs are seen to be in constant motion but never touching each other or forming groups. If to a drop containing these bacilli there is added a drop of serum (the liquid part of the blood) from a normal person or from some one suffering from any disease except typhoid fever, no change is observed, but if the serum is obtained from a typhoid fever patient the effect is prompt and very striking. The germs become less and less active in their motion until finally all movement ceases, and instead of being scattered about one by one they all collect in clusters or clumps so that no single individuals are anywhere to be seen. The rapidity with which this clumping takes place depends on the concentration of the serum used; and in practise it is customary to dilute the serum with twenty or more parts of fluid and to add one drop of this mixture to the culture of bacilli. The serum is obtained by pricking the patient's finger or ear-lobe with a small lancet and collecting a few drops of blood, from which the serum can be separated in several ways. While the Widal reaction is of inestimable service to the physician, there are a few, a very few, exceptions to its reliability, and it also has the

disadvantage of sometimes not appearing until the second week of the disease. Usually, however, it is present toward the latter part of the first week. Early in the illness a single negative test is not conclusive, and in cases in which the reaction is not present when first tried it should always be repeated at intervals of a few days until either a positive result is obtained or the disease develops in such a way as to prove that some condition other than typhoid is responsible for the illness. The boards of health of nearly all cities of any size now make the Widal test for physicians as a regular part of their duty to the public; and as the blood to be examined can easily be sent by mail no patient living in a region where there is a post-office need be deprived of the benefit of this invaluable aid to diagnosis when typhoid fever is suspected. In view of the importance, not only to the patient but also to his family and neighbors, of having typhoid fever recognized early if it is present, resort to the Widal test should never be neglected in doubtful cases.

WILD-CHERRY BARK.—See PRUNUS VIRGINIANA.

WILD GINGER.—See ASARUM.

WINE.—The fermented juice of the grape. The grapes are pressed into large vats, whereupon the juice, or "must," is freed from the solid residue, and left to undergo fermentation. The juice consists mainly of water, holding in solution grape-sugar, tartaric acid, dextrin, albumen, and various other extractives; and it ferments readily without the addition of any foreign substances. If the quantity of sugar present in the juice be insufficient, more is usually added.

The process of fermentation converts the grape-juice into alcohol and carbonic acid, the latter escaping as bubbles, and giving the young wine, while still cloudy, its piquant taste. The more sugar the grapes contain, the richer in alcohol does the clarified product become. Wines made from the sweet southern grapes are, therefore, the most intoxicating. Champagne, Port, Madeira, Sherry, Tokay, Malaga, and Marsala contain between 12 and 20 per cent. of alcohol; Claret, Moselle, Rhine wine, and Burgundy, between 8 and 12 per cent.

On account of the comparatively large amount of alcohol contained in wine, even the lighter varieties must be regarded as absolutely injurious in the treatment of children. Stronger wines are actual poisons to children below the age of fourteen. In adults, wine may occasionally be indicated as a stimulant in the treatment of certain diseases. Moselle wine, for instance, has a stimulating effect on the intestine, on account of the acid it contains. The contrary effect is produced by clarets, which contain a considerable amount of tannic acid, rendering them astringent. Champagne owes its effervescent qualities to its contents of carbon dioxid gas. Sherry wine is used as a menstruum in various pharmaceutical preparations.

WINTERGREEN.—See GAULTHERIA.



PLATE XXIV.—FLOWERING PLANTS

1. Laburnum (Cytisus Laburnum)

- a. flowers** **b. pods** **c. seed**

2. Bittersweet (Solanum dulcamara)

- a. flowers** **b. berry**

3. Mezereum (Daphne Mezereum)

- a. berries** **b. flowers**

4. Henbane (Hyoscyamus niger)

- a. flowers and fruit** **b. seed-capsule with seeds**



WOMB (UTERUS), DISEASES OF.—The womb is one of the internal organs of generation in the female, and is suspended in the pelvis by means of broad ligaments (see pp. 75-76). It may be entirely absent, in which case menstruation does not occur, and there is no possibility of conception. If the ovaries are present, violent colicky pains which eventually necessitate their removal, may occur at the time menstruation under normal conditions would have taken place. Disturbances in the development of the uterus generally give rise to no disorder until after the time of puberty, when menstruation fails to appear, and pain is felt. Defective development of the womb is occasionally accompanied by severe chlorosis (see ANEMIA). General and, if necessary, also local treatment—with iron preparations, hydrotherapeutics, electricity, etc.—often influences the development of the womb to such an extent that menstruation may take place and conception be rendered possible. Occlusion or narrowing of the mouth of the womb represent limited disturbances of development. The former condition gives rise to blood-tumors of the womb; the latter produces violent, spasmodic pains during menstruation (*dysmenorrhea*), and infecundity. In case of occlusion it is necessary to provide an artificial opening; while in case of a narrowing of the mouth, it is sufficient to introduce a probe to widen the mouth. This causes the colicky pains to cease, and renders conception possible.

Other affections of the uterus will be considered under their separate headings in the following paragraphs.

Cancer of the Womb.—This disease, which is absolutely fatal unless an operation is performed, causes the death of a large number of women of a mature age. The affection is characterized by a morbid growth of the outermost layers (*epithelium*) of the mucous membrane of the uterus. The new tissue spreads throughout the body of the uterus, and destroys it; and it may pass also to the surroundings of the womb, even to the bladder and rectum. This new growth causes the appearance of cancerous nodes, varying in size between that of an egg and that of a clenched hand. In many patients a cancerous ulcer develops as a result of an early breaking down of this new tissue; and this ulcer likewise spreads to the adjacent parts, destroying them. Like a parasite, the cancerous proliferation affects the bodily functions, at the same time weakening the entire organism on account of the pain it causes. Hemorrhages and suppuration add to the patient's sufferings. The pains, unfortunately, do not occur until it is too late to perform a curative operation. On the other hand, hemorrhages and leucorrhea-like discharges—the purulent nature of the latter appears only gradually—are the accompanying symptoms of many comparatively harmless affections; and for this reason many patients suffering from cancer of the womb, are not induced by these symptoms to subject themselves to a medical examination.

The possibility of a cure of cancer of the womb exists only if the disease be recognized before the cancer has spread to the surrounding organs and tissues. The point to be borne in mind, is that the removal of the womb through the vagina (to-day an operation that is almost without danger) may result in a permanent cure only so long as the cancer is restricted to the uterus itself. The following statements may save much explanation:

(1) Cancer of the womb usually begins with a slimy discharge, or with slight bleedings. These hemorrhages may at first be mistaken for increased

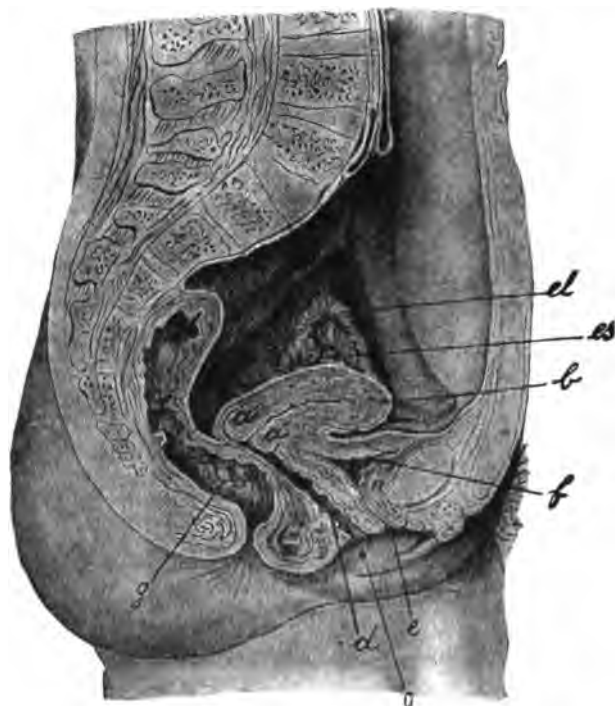


FIG. 442. Longitudinal section through the lower part of the abdomen, to show the pelvic organs.

a b the womb (*a* its cervix, between *a* and *a* the cervical canal with the os uteri, *b* its fundus); *d* vagina; *e* urethra; *f* bladder; *g* rectum; *h* left oviduct; *h* left ovary; *i* opening of the left Bartholinian gland.

menstruation. Pain does not occur until it is too late for a successful operation.

(2) Since cancer may spread from the womb to the surrounding parts in a comparatively short time after the onset of a discharge, and since cure by operation is then no longer possible, it is necessary for the patient to consult a physician immediately after the occurrence of the first slimy discharge or the first hemorrhage.

(3) In the case of irregular hemorrhages, or too profuse menstruation, the patient should under no circumstances wait for the bleeding to stop before consulting her doctor; for, in the presence of cancer, these hemorrhages

frequently continue until stopped by medical means. The patient should at once have herself examined.

(4) Discharges and hemorrhages occurring in young persons may, of course, be due to other causes than cancer. For the sake of the patient's peace of mind, however, an exact diagnosis should at once be made by the physician, so that appropriate and timely treatment may be had.

(5) Profuse menstrual hemorrhages, especially during the change of life, require immediate medical treatment. They are always due to affections of the womb, frequently to incipient cancer. It is particularly important to remember, that hemorrhages which occur after menstruation had ceased for some time are always to be regarded as possibly due to cancer.

(6) Simple inflammations of the mucous membrane of the womb in young women require careful, usually local, treatment, as these inflammations may give rise to cancer at a later period.

Catarrh of the Womb (Leucorrhea).—A disease due to inflammation or proliferation of the mucous membrane of the uterus, chiefly of the neck, or *cervix*. It is characterized by the discharge of a muco-purulent fluid, and frequently also by increased menstrual flow. Catarrh of the cervix is a very frequent affection, and is brought about by all those causes which give rise to chronic inflammation of the womb (which see). It may be due also to general disturbances of nutrition, as well as to uncleanness during menstruation, when the blood adhering to the external genitals is allowed to pass into a state of putrefaction, thus infecting the womb. It follows, that leucorrhea occurs frequently in virgins. In the more marked degrees of the affection, the patients may become considerably run down.

If a regulation, according to hygienic principles, of the entire mode of living has been without results, local treatment must be resorted to. This consists in cauterization of the affected part of the mucous membrane, or in scraping the womb. The latter operation is quite harmless; and the diseased parts of the membrane, which are removed, are soon replaced by a growth of new, healthy tissue. The parts removed should be microscopically examined, in order to determine whether the affection was a simple catarrhal inflammation or the beginning of a cancerous growth. The naked eye is unable to recognize the differences.

Displacement of the Womb.—The correct position of the womb is about as follows: When the bladder is empty, the uterus of a standing woman lies almost horizontally in the pelvis, its fundus, or end, forward, and the vaginal portion posteriorly. The uterus is also bent slightly forward (see Fig. 442). When the bladder is full, the fundus is pushed backward and upward, whereas the vaginal portion advances forward and downward. This change of position should be taken into consideration by a sick woman, in so far as she should discharge her urine before submitting to a gynecological examination.

If the last-named position of the uterus persists also when the bladder is empty, a backward inclination of the womb is present. If, as is often the case, this position is accompanied by a backward curvature, *retroversion* or *inflection* of the womb is the result (see Fig. 443). This is a displacement which occurs in about 20 per cent. of female diseases. It may be congenital, or acquired during early childhood, as by a fall. In the latter case, the condition frequently gives rise to violent pains resembling those accompanying peritonitis or appendicitis. Moreover, an inflammation of the appendix may, on account of the adhesions it causes, be the direct cause of retroversion of the womb. This faulty position of the womb is very often produced in childbed, either by a deficient involution of the ligaments of the womb,



FIG. 443. Retroversion of the uterus, shown in section.

a cervix; b fundus of the womb; d vagina; e urethra; f bladder; g rectum.

which are no longer capable of drawing the fundus of the uterus forward after it has been displaced by the filled bladder, or by inflammatory adhesions of the ovaries or tubes with the posterior wall of the pelvis. It is obvious that, independent of childbirth, all causes leading to inflammation of the ovaries and of the pelvic peritoneum (gonorrhea, for instance), may give rise to a backward displacement of the womb.

The symptoms characterizing retroversion of the womb consist in pains in the small of the back, discharge, increased menstruation, frequent desire to urinate, and constipation. Instead of these local disturbances, nervous reflex irritations (headache, pain in the stomach, etc.) may be present. These disturbances should disappear as if by magic after the womb has been placed in its correct position. If they do not, the inference is that they were not due to the displacement.

The treatment of retroversion consists in placing the womb in its correct position, and keeping it there by means of a pessary. This treatment strengthens the ligaments of the womb; and recent cases, especially those treated soon after a delivery, may be so completely cured that the pessary can be dispensed with in about three months. Every woman should undergo a medical examination after childbirth, in order to determine whether the womb is in the correct position or whether it has been displaced. In old cases it may be necessary to wear a pessary constantly. To avoid this, and in cases where the pessary proves inefficient, the affection may be cured, without danger, by an operation whereby the fundus of the womb is sutured to the anterior wall of the abdomen or to the anterior wall of the vagina. This causes an artificial adhesion which keeps the fundus of the uterus downward.

After delivery the vagina may be greatly relaxed; and when this is the case it may happen, if the patient gets up too soon and attends to her work, that the womb suddenly or gradually falls downward, dragging the vagina with it. This is called *prolapse* of the womb. In such a case the uterus is situated in front of the genitals, in a pouch whose size may vary between that of a fist and that of a child's head. In this pouch may be recognized the vaginal part of the uterus (Fig. 444, *a a*), the anterior wall of the vagina (*a-e*), and the posterior wall of the vagina (*a, d*). The remaining part of the womb, and a portion of the bladder (*f*) may be felt also. This extremely annoying—in fact dangerous—condition, affects principally hard-working women of the lower classes, who often get up and begin work too early after childbirth. The pessary treatment of such cases being attended by many disadvantages, operative interference is often necessary. Medical supervision, and the observance of the rules of hygiene during pregnancy and labor, render it possible to prevent these troublesome displacements, or to correct those that have already arisen, without resorting to operative means.

Hemorrhage from the Womb.—

Bleeding from the womb may occur at any age. After the onset of menstruation, it is a physiological event at regular intervals of 28 days (see MENSTRUATION). Hemorrhages

other than those due to menstruation are not infrequent, even in young children, and require careful attention. Irregular menstrual hemorrhage itself often needs careful hygienic management. Excessive menstruation may be due to a number of causes. A pronounced proliferation of the mucous membrane of the uterus, necessitating removal by scraping, is one of the most persistent causes. The slight operation of scraping the uterus is performed under anesthesia; and it often transforms anemic, listless individuals into healthy and active women. Hemorrhage in young married women is often due to late or tardy involution of the uterus after the birth of a child, or it may follow uterine displacements. It may result also from miscarriage, in which remains of the fetal structures have not been passed. When occurring in older women, hemorrhage is usually the sign of the presence of a tumor. The possibility of a cancerous affection of the uterus should be

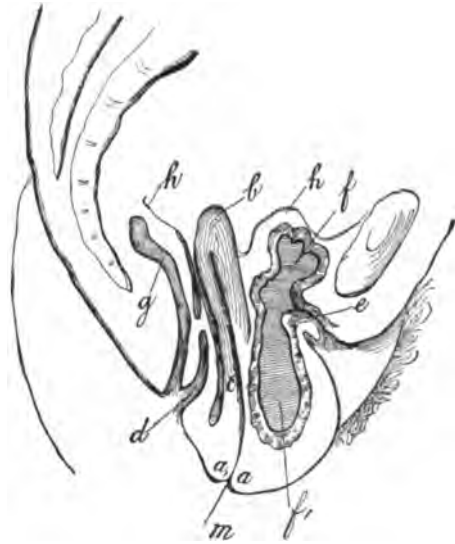


FIG. 444. Prolapse of the womb (longitudinal section).

a a, lips of the cervix; *m* os uteri; *c* cervical canal; *b* fundus of the greatly elongated womb; *d* vagina; *e* urethra; the cervical wall between *a* and *e* has fallen forward, drawing with it also a part of the bladder (*f*); *g* rectum; *h* peritoneum.

carefully considered, especially when hemorrhage occurs after menstruation had ceased for some length of time (see *Cancer of the Womb*). In general, hemorrhage from the uterus occurs, not only in all affections of that organ, but also as a result of diseases of the tubes and ovaries. It may result also from disturbances of the circulation, due to disorders of the heart or of the lungs.

Uterine hemorrhage is always a sign of some disease. This is particularly true when it occurs during the change of life (see *MENOPAUSE*). The patient should always submit to an immediate examination by a physician, and not wait until the bleeding has ceased. In many cases of cancer of the womb, the hemorrhage does not stop of its own volition, and thus valuable time is lost.

Inflammation of the Womb.—Two forms of this affection may be distinguished: the acute and the chronic. The acute form (acute *metritis* or *endometritis*) is brought about by the entrance of bacteria into wounds caused during delivery or by a surgical operation. It is frequently occasioned by a gonorrheal infection of the mucous membrane of the uterus, the inflammation thence spreading to the muscular wall of the womb. The condition may terminate in death if the inflammation involves the peritoneal covering of the uterus. Fatal results, however, may be prevented by early professional treatment.

In many instances an acute metritis develops into a chronic form of the disease. Chronic inflammation of the body of the uterus may develop from the same causes as the acute form, if the infections are less virulent. It may be due also to incomplete involution, to displacements of the womb after childbirths, to constant overfilling of the bladder and rectum, to sexual irregularities and excesses, and to diseases of the heart and lungs. Inflammation of the womb leads to proliferation of the connective tissue and, thereby, to enlargement of the organ.

Acute metritis begins with violent pains in the region of the lower abdomen, and with fever and purulent discharge; it is sometimes accompanied also with distention of the abdomen and with vomiting. In the chronic form the abdominal pains are less severe, or they may be entirely absent; whereas pains in the small of the back, a sensation of heaviness in the pelvis, and increased menstruation usually accompany this condition.

The treatment of acute metritis requires absolute rest in bed, cold applications (ice-bags or compresses) to the abdomen, and careful local treatment by a qualified physician. In the chronic form it is of great importance to obviate the exciting causes of the affection as much as possible. In case of displacement of the womb, the condition should be corrected; and prompt treatment should be given in cases of catarrh of the uterus, constipation, or diseases of the heart or lungs. When necessary, the physician may prescribe hydrotherapeutic measures, such as irrigations or baths. If that part

of the uterus which projects into the vagina is greatly enlarged on account of inflammatory tissue-proliferations, and covered with severely inflamed mucous membrane, it may be necessary to remove part of the vaginal portion. This results in a diminution in the size of the womb, and in retrogression of the organ.

Tumors of the Womb.—In addition to cancer (which see), the womb may become the seat of other dangerous forms of tumors. Stoppage of the mouth of the womb (which opens into the vagina) may occur from the time of birth, and may remain unnoticed until the time of puberty when it prevents the discharge of the menses. This causes an accumulation of menstrual blood in the uterus, which gradually distends that organ as well as the Fallopian tubes, and gives rise to violent pain. Unless relieved, this blood-tumor may attain a size of several inches in diameter, until it finally ruptures, causing a fatal inflammation of the peritoneum. Severe abdominal affections may, therefore, occur in virgins. This fact should be remembered, since the popular idea is that female disorders can occur only after sexual intercourse has taken place. See also HYMEN.

Fibrous tumors of the womb are composed of the same kind of tissue as the uterus itself; namely, of connective tissue and smooth muscle-fibers. This form of tumor usually develops in women between forty and fifty years of age; and fibromata, growing more or less rapidly, may finally occupy the entire abdominal cavity. In addition to the symptoms characterizing ovarian tumors (see OVARIES, DISEASES OF), fibroid tumors of the uterus generally cause profuse hemorrhages from the womb. Even small pedunculate fibromata (*polypii*) of the womb may induce such hemorrhages, and cause an extreme degree of anemia which necessitates the immediate removal of the tumors, or, at times, even of the womb itself. On the other hand, fibrous tumors of the size of a man's head may exist without causing any marked disturbances—neither hemorrhages, nor pains, nor symptoms of pressure. In such cases the patients may quietly await developments, as these tumors often cease to grow for years. In fact, they may even shrink spontaneously during the change of life. It must, however, be remembered, that even these benign tumors may develop into cancerous growths; and this fact must be borne in mind when the tumor suddenly begins to grow rapidly, giving rise to severe pain, loss of strength, hemorrhages, and discharges from the womb.

The removal of the womb is an operation which at the present time can be performed with little danger. The uterus may be removed either through the vagina or through the abdominal wall. Fibroid tumors may be removed in the same manner. In young women, who wish to bear children, it is often possible to preserve the uterus by extirpation of the tumor nodes. This operation, however, may at times be attended with greater danger than the removal of the entire womb, including the tumors. besides, small nodules

may be overlooked at the time of the examination, and their growth may necessitate a new operation after the lapse of several years.

WOOD-TICK.—A small, oval insect of a reddish color (the *Ixodes ricinus*), which inhabits pine-woods. The female, which is one to two millimeters long, attaches itself to the human skin by means of its suckers, fills itself with blood, and gradually becomes distended to the size of a bean (see Fig. 445, *b* and *c*). It adheres firmly to the skin, and should not be torn off, because by doing so the head would remain in the skin and give rise to inflammation. By touching the insect with turpentine, benzin, or kerosene, it becomes detached and drops off.

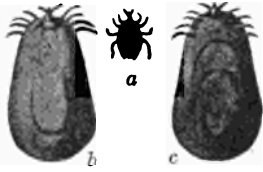


FIG. 445. *a* Wood-tick (somewhat enlarged); *b* back, and *c* belly of insect distended with blood.

WORMS.—These parasitic animals are usually located in the alimentary canal; although the term may be extended sufficiently to include also those forms of worms which are known to burrow into the skin, or may even be found in the eyes, blood-vessels, liver, lungs, muscles, connective tissue, kidneys, and brain. Those parasites which inhabit other localities than the intestinal canal are comparatively infrequent in the United States. Thus, the *Filaria Medinensis* and the hook-worm or *Uncinaria* have been found in the skin, whereas the *Filaria loa*, the *Cysticercus*, *Trichina*, and the larvæ of tapeworms have been found in the eye as well as in the brain. The cysticercus as well as the echinococcus larva of the tapeworm are known to occur in almost all tissues of the body, giving rise to very characteristic and often fatal symptoms. They are, however, described in the article on TAPEWORM and also in the article on FILARIA, to which reference may be made. The blood is the site of a very interesting animal, the *Filaria Bancrofti*, one species of which is recorded as occurring in the United States, although its chief habitat is in Africa and Europe.

A number of forms of worms are known to make the liver their home. Practically none of these, however, are as yet known to occur in the United States, although the flukes (the *Fasciola hepaticum* and the *Dicrocoelium lanceolatum* of Europe, and the *Paragonimus Westermanni* of Asia) are known to be present in other hosts than man; and hence it is not at all unlikely that they may some day be found in the human species.

Flukes.—The *Fasciola hepaticum* or *Distoma hepaticum* is a common parasite of the ruminants. It is a small worm, being only 1 to 1½ inches in length. A related species, *Distoma (Dicrocoelium) lanceolatum*, is found very commonly in cows and sheep in Europe; while in Japan there is a *Distoma* which is widely distributed among cattle, and affects human beings as well. In certain provinces in Japan it has been estimated that this parasite (*Distoma sinense*) is present in twenty per cent. of the population. The *Distoma jelineum* is a frequent parasite among Russians; and it has

been found among cats in Nebraska. For the most part the flukes thrive best in the liver, particularly in the bile-ducts, and often give rise to fatal jaundice with dropsy. The ova may be found in the stools. In another fluke-disease, caused in Asia by the *Distoma (Paragonimus) Westermanni*, the parasite lives in the bronchial tubes and gives rise to cough and pneumonia with bleeding from the lungs. It is an epidemic affection. The genito-urinary organs are the site of another fluke, the *Bilharzia*, which causes symptoms of pain on urination, associated with bloody urine, and anemia.

A large number of pseudoparasites belonging to the class of worms have been found from time to time. These, however, should be regarded as incidents of accidental parasitism, often brought about by swallowing the larvæ of these animals. Thus, the hair-snake, which is a common inhabitant of fresh-water pools, is swallowed quite often, and, living for from ten to twenty hours, may be vomited or passed in the feces and taken for a genuine parasite. It can not, however, maintain a separate existence in the intestinal canal. The same may be said of a number of larvæ of insects, the arachnids, etc.

Roundworms.—Another class of worms is that of the nematodes, to which the common roundworm (*Ascaris lumbricoides*) and the pinworm or seat-worm (*Oxyuris vermicularis*) belong. The *Ascaris* is one of the most frequent of the intestinal parasites. The worms are small, the male being from 4 to 8 inches in length, the female double that size. It is long and thin, resembling an earth-worm, and has four longitudinal bands and many transverse rings and ridges. The eggs, which are very numerous, are small, only $\frac{1}{800}$ of an inch in diameter, and are elliptic in form with a distinct covering. The roundworm lives in the upper part of the small intestine, and no intermediate host is known. As a rule only a few worms are present, although occasionally a patient harbors a great many. Living best just below the opening of the stomach into the intestine, the worm not infrequently gets into the stomach from whence it may be vomited. The symptoms are none at all or those of mild indigestion. In children, however, there may be marked nervousness, restlessness in sleep, and even convulsive seizures from intestinal irritation. Picking at the nose, twitchings, and marked mental distraction may also be observed. Diagnosis is made by microscopical examination of the stools. The treatment for roundworm is always difficult, as only a few anthelmintics are available. These are san-tonin, spigelia, and chenopodium; but they should be administered only on a physician's prescription.

Pinworm.—The pinworm, threadworm, or seat-worm (*Oxyuris vermicularis*) is an inhabitant of the lower bowel, principally of the rectum and colon. It may, however, be found as high up as the appendix. The male worm is about one-sixth of an inch long, while the female may be as

long as half an inch (see Fig. 446). The chief symptoms caused by this worm is local itching, which at times may be very severe. Restlessness and irritability are often present, and frequent urination is not uncommon. Picking at the nose may also be observed, and anemia and loss of appetite are not infrequent symptoms.

The methods of treating pinworms are numerous. Examination of the stools for eggs is desirable to establish the diagnosis in case no worms can be detected. Local irrigations by means of infusions of quassia, cinchona, etc., following a complete cleansing of the bowel by a saline cathartic, is the approved mode of treatment. In many patients it is a very difficult matter to get rid of these parasites, and continued treatment, even for years, may have to be carried on before recovery takes place. In individuals who suffer from polypi of the lower bowel, infection by pinworms is very frequent, and their eradication is very difficult.

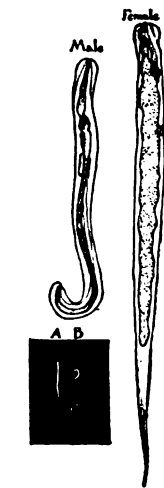


FIG. 446. The pinworm (*Oxyuris vermicularis*). Natural sizes shown below: A female, B males.

The so-called "tapeworms" are the most important worms found in human beings, and their life history is of considerable interest. Three of the most important forms are discussed in the article on TAPEWORM; and it only remains to be added that within recent years a few more interesting worms have been discovered which are of considerable importance. The most striking and widespread of these is the *Uncinaria* or hook-worm, which has been known for a long time in Europe. Until the work of Stiles and others, this parasite had more or less escaped observation in the United States. The disease was first described as occurring with greater frequency among miners in Europe; and naturally, when it was looked for among the same class of workmen in America, it was found. Furthermore, it has been learned that the hook-worm disease is by no means confined to miners, but is known to be comparatively widely distributed throughout the southern portion of the United States, contributing to the anemia of the poor whites of the south.

The study of the spread of parasites is of great interest; and as countries grow more and more populous and individuals are forced to live closer and closer together, it is found that parasites spread more widely. The most important factor in the spread of parasitic diseases is the water supply; and impure or contaminated water is responsible for the spread of the great majority of parasites here considered. The *Bothriocephalus latus* offers an excellent example. This parasite is found very commonly in places which are in close relation to large bodies of water where the sewage is not carefully disposed of, but allowed to flow into the water supply. The eggs of the parasite are discharged into the water, and fish serve as intermediate

hosts. In them the worms develop a form of existence which can continue indefinitely. The fish may be caught, brought into market, sold and eaten, and the disease thus communicated.

The layman should, above all things, bear in mind that the diagnosis of intestinal worms is extremely easy. One need not rest on the physician's assurance that the patient has worms, but should insist on microscopical examination of the stools, when the eggs of the animal may be clearly shown. Not only is it possible to learn that the patient has a worm or worms, but the microscope can show just what form of worms are inhabiting the intestinal canal, and thus appropriate treatment can be inaugurated. Guesswork in this respect loses a vast amount of valuable time and is a reflection on the education of the physician.

Enlightened prophylaxis must not depend solely on national prejudice, but must have its roots in the education of the individual. So long as the mass of the population remains ignorant regarding the mode of spreading of these parasitic diseases, so long will they suffer from them. It is to be considered fortunate that the well-informed do not have to suffer from the ignorance of the masses in this respect, as they have to in the matter of infectious diseases. There is no necessity for any one to become infected if he follows out proper hygienic precautions. This can not be said of the contagious diseases. Avoidance of eating raw meat, particularly raw pork and fish, as well as pickled meat and pickled fish; absolute cleanliness in the preparation of vegetables, especially salads, which should be repeatedly washed in running water; the restriction of the feeding of offal to pigs; taking care of the finger-nails; and the use of proper feeding-implements,—these are all individual modes of prophylaxis which can not be too highly insisted upon as being essential if one would avoid infection.

WORMSEED.—See **CHENOPodium**.

WOUNDS, TREATMENT OF.—Cleanliness is the first essential in the treatment of open wounds of any kind. They must be most carefully guarded against contact with dirty objects, such as handkerchiefs, rags, clothing, soiled fingers, etc. Only perfectly clean, boiled water, or some antiseptic solution may be used for cleansing them. The fingers should not touch a wound until the hands have been thoroughly disinfected.

For some time after bleeding has stopped, all cut wounds discharge a serous fluid which aids in the healing process. Only absorbent materials, such as cotton, lint, etc., should be used for dressing a wound. Various antiseptics (iodoform, corrosive sublimate, boric acid, etc.) are of service in protecting the wound, as they prevent the development of bacteria that may have entered. They also avert decomposition. Such remedies as *arnica*, various herbs, cobwebs, urine, court-plaster, gummed paper, etc., are useless and harmful.

A study of the process by which wounds are healed, has demonstrated

the fact that the functions of repair reside in the body; and the better the wound is protected against harmful influences (bacteria), the quicker does the healing process advance. For this reason, wounds should be dressed with germ-free (*aseptic*) materials after they have been thoroughly cleaned, or with germ-destroying (*antiseptic*) materials if they show signs of having already become contaminated. The removal of bullets, splinters, or other foreign bodies that may have entered the flesh, should be effected under modern antiseptic precautions. To attempt to remove such objects by exerting pressure on the parts, or by digging with dirty needles, pen-knives, etc., does more harm than good. Nothing but aseptic instruments and antiseptic dressings should be allowed to come in contact with a wound, in order that inflammation and suppuration may be warded off, and the natural curative efforts of the body aided. The great success of modern surgery is due to the strict observance of these rules, which has made it possible to prevent dangerous wound-diseases and to perform operations which formerly were impossible.

The process of healing may take place either by *first intention* or by *second intention*. The former term refers to the healing of wounds in which inflammation and suppuration have not taken place, and in which the natural healing powers of the body are sufficient to effect a cure. The skin is not only a protective covering for the underlying tissues, but also a mechanism for the healing of wounds. In the case of small clean wounds, the blood, clotting on the surface, forms a protective covering beneath which the healing process can go on undisturbed. This is a matter of daily observation in the cases of simple cuts. If the wound is large, and the severed edges of the skin have become widely separated, nature may be assisted by having the edges sutured together under antiseptic precautions. If this be not done, a tedious process of new tissue formation ensues, and a disfiguring scar frequently results.

When the process of healing has been disturbed or prevented by the entrance into the wound of poisonous bacteria, inflammation and suppuration is the result. These disturbances are usually accompanied by local pain and by more or less fever (wound-fever). A loss of tissue likewise results, and healing is retarded, often for a considerable period. The wound-edges are not agglutinated by coagulated blood, but are gradually brought together by new fibrous tissue (granulation tissue); and a broad ugly scar remains when the wound is finally healed. In the cases of such suppurating wounds, antiseptic dressings, which must be changed at regular intervals by a physician, are necessary to arrest the inflammatory process and to aid nature in overcoming the bacterial infection. These disturbances may almost invariably be obviated by treating all wounds in the manner indicated in the foregoing. For wounds which involve large blood-vessels, see **HEMORRHAGE AND ITS CONTROL**.

WRITERS' CRAMP.—This is one of the most important of the so-called OCCUPATION NEUROSES (which see), owing to its frequency and obstinacy. It generally affects persons who write a great deal, and who at the same time pay attention to penmanship; but less frequently those who, although writing much, are less careful of their handwriting. The disturbances may occur either in the form of cramp, or paralysis, or tremor. The first-named condition may appear very shortly after beginning to write, and consists in spasmodic contractions of the individual fingers or of the entire hand. This causes the pen to be either pressed hard against the paper or held away from it, or the writer may drop his pen-holder.

Writers' paralysis is usually accompanied by dull pains in the hand, radiating through the entire arm up to the shoulder. Writing may become impossible for some time. In the case of cramp as well as of paralysis, it is usually possible for the writer to resume work after a brief rest, and with a supreme effort of the will. The disturbance, however, will soon recur; and the frequency of the recurrences seems to increase with the persistency of the writer's attempts to overcome the difficulty.

Writers' tremor, as implied by the name, consists in a trembling of the hand, which gives the individual letters a serrated or wavy appearance. If the disturbance be very pronounced, the writing becomes illegible. As a rule all these disturbances take place only during writing, and are not present when the same muscles perform other work.

The principal cause of this affection is overexertion. A faulty position, holding the pen in a wrong manner, uncomfortable desks or tables, and unsuitable pens are contributory causes. Many hold the introduction of steel pens responsible for the increased frequency of the affection in the present age. In opposition to this contention, it may, however, be stated that writers' cramp is observed also in persons writing with quills. Nervous diseases, alcoholic and sexual excesses, and injuries to the hands (sprains) may be causative factors. Insecurity, fatigue, and dull pain after writing may be premonitory symptoms.

The treatment of the disturbances here discussed, requires great patience on the part of the physician as well as on that of the patient. Attacks of cramp may persist for several weeks, and are apt to recur. Since these patients usually earn their living by writing, only a few are able to comply with the principal requirement: namely, entirely to give up writing for some time. Under no circumstances should the patient allow valuable time to be lost by experimenting with various pens and pen-holders. Only a physician is able to decide on the plan of treatment best adapted for each individual case, not only with regard to the existing form of disturbance, but also with respect to the patient's state of mind which is often greatly depressed. The physician will also select the pens and pen-holders most suitable for the patient. Treatment, which principally consists of massage, gymnastics, and

writing-exercises of different kinds, has recently been so greatly developed by physicians, that much better results are obtained now than formerly, and many cures are effected.

WRYNECK.—A peculiar condition, in which the head is inclined to one side, and at the same time slightly twisted toward the opposite side (see Fig. 447). This affection



FIG. 447. Wryneck.

may be due to different causes. It may be congenital (especially in breech presentations), in which case it is due to a shortening of a neck-muscle; or it may be due to a fracture or dislocation of the cervical part of the spinal column, or to inflammatory processes and scar formations on the neck.

Wryneck may result in asymmetry of the two halves of the head, and in curvatures of the vertebral column. It is important, therefore, that the affection be corrected before these conditions develop. In milder cases this may be accomplished by means of bandages which keep the head

straight. If the affected muscle is considerably shortened, the sinew of that muscle must be cut. Fractures and dislocations of the cervical part of the spinal column must be set. If the wryneck be due to scars, an operation may be necessary. The spasmodic type of wryneck (*torticollis*) is a habit spasm, a tic.

Y

YELLOW FEVER.—An acute, infectious disease which runs a rapid course, and which is restricted principally to the warm countries of the western hemisphere, occurring mainly in populous cities with maritime traffic. In Europe, only the southwestern countries, especially Spain and Portugal, have been visited by severe epidemics. It has been observed that epidemics have frequently occurred on ships sailing from infected ports.

The disease is caused by a certain poison, the nature of which is not known as yet. It appears, according to the most recent investigations, that mosquitoes play a part in the transmission of the disease, as is the case

with malaria. It is certain that the poison, in order to develop, requires warmth and humidity. It is not believed that the affection can be transmitted by human beings, or by maritime traffic, without the agency of mosquitoes. The interval between infection and the outbreak of the disease is usually two or three days, seldom more than five.

The onset of yellow fever is usually marked by a sudden chill, followed by fever. The patient at once feels seriously ill. The face becomes markedly red and swollen, and also the conjunctivæ of the eyes become red. Great thirst prevails, with pressure and marked tenderness in the region of the stomach, sometimes accompanied with vomiting, often with constipation. Jaundice sets in, generally toward the end of the first stage of the disease (which lasts several days to a week), sometimes later. The fourth day usually witnesses a considerable abatement of almost all the symptoms of the disease. In severe cases this apparent improvement is followed by an aggravation of the condition, in which vomiting is one of the principal symptoms. Small quantities of blood are mixed with the vomitus, and later it may happen that black masses resembling coffee-grounds are thrown up. These masses consist of blood which is changed by the acids of the stomach. This so-called "black vomit" is dreaded as a very grave symptom. In fatal cases, similar masses are discharged with the stools. Hemorrhages frequently occur also in other organs: from the nose, from the mouth, into the skin, etc. The secretion of urine may be entirely suppressed; and this is always a fatal sign. Death usually takes place between the fourth and tenth days of the disease. The mortality in the different epidemics fluctuates between 15 and 75 per cent.

The disease requires the immediate attention of a physician. It is customary to begin treatment with remedies that cause perspiration, and with the administration of purgatives.

As to the prevention of yellow fever, the principal requirement consists in carrying out extensive hygienic measures looking toward the complete extermination of the transmitting mosquito, the most important species being *Stegomyia fasciata*. All pools, cisterns, pot-holes, fountains, empty tin cans, etc., in which it is possible for the mosquito to breed, should be oiled or destroyed. Particular attention must also be paid to preventing the mosquito from getting the disease, and thus making it liable to carry the infection. For this purpose all patients suffering from yellow fever should be protected by mosquito-netting, and all sick-rooms screened, so as to keep the mosquitoes out. People traveling in the tropics should always be supplied with mosquito-netting.

Z

ZINC SALTS.—The salts of zinc are used to some extent in medicine. Soluble zinc salts combine with albumen, forming insoluble albuminates; their action is therefore astringent, and in large quantities distinctly irritating. Of the salts sometimes used, the acetate, carbonate, chlorid, oxid, and sulfate are the most common. The sulfate and acetate are used in solution as astringent applications in some diseases of the eye, and in gonorrhea. The sulfate is sometimes given in doses of ten to thirty grains as an emetic. Zinc carbonate and zinc oxid are largely used externally for various skin-diseases, the ointment of oxid of zinc being a very soothing and slightly astringent salve. Zinc chlorid is quite irritating, but is used in weak solutions for its astringent action. Stronger solutions are of use as caustics, and are sometimes utilized to destroy cancerous growths.

Poisoning by zinc sometimes occurs in men who are working with the metal. There is a sense of general discomfort and pain, followed by chills and sweats, with cough and soreness of the chest. The condition is probably due to inhaling the fumes of the zinc, and is very apt to recur frequently. Acute poisoning may occur from an overdose of any of the salts. The symptoms are those of inflamed stomach and intestines. Albumen, as eggs or milk, should be given.

ZINGIBER.—See GINGER.

POISONS
THEIR EFFECTS AND ANTIDOTES, AND THE
TREATMENT OF POISONING

POISONS

THEIR EFFECTS AND ANTIDOTES, AND THE TREATMENT OF POISONING

In any case of poisoning, summon a physician at once, and until he comes confine your efforts to those details of treatment which are most urgent. Those accidents in which the poison has been swallowed, usually call for the speedy production of vomiting, the administration of stimulants, and the application of external heat (hot-water bottles, blankets, etc.). When poisonous gases have been inhaled, fresh air and artificial respiration (as described under that heading in volume I. of this work, pp. 147-151) are required. In cases of poisoning by narcotics (opium, morphin, etc.), it is of paramount importance to keep the patient awake.

ACETANILID.—*Effects:* Loss of sensation, paralysis, heart depression, destructive changes in the blood, cyanosis, etc. *Antidotes and Treatment:* Apply heat externally (hot-water bottles, etc.), administer stimulants, give caffein or strychnin to aid respiration, belladonna in small doses, and, if the skin be blue, oxygen by inhalation.

ACETIC ACID.—*Effects:* Nausea, vomiting, abdominal pains, low temperature, impaired respiration. *Antidotes and Treatment:* Give large quantities of milk, lime-water, and solutions of soap, and keep the patient warm by external means. A small dose of opium may be given to relieve pain.

ACONITE.—*Effects:* A tingling sensation followed by violent pain in the mouth, esophagus, and stomach; excessive flow of saliva; nausea, vomiting, and diarrhea; cold and clammy perspiration; numbness over the extremities, or sometimes over the entire body; protrusion of the eyeballs; muscular relaxation; sometimes loss of consciousness. The pulse is slow and irregular, and the temperature considerably below the normal. If the dose has been large enough, death occurs from respiratory paralysis. *Antidotes and Treatment:* Place the patient flat, with his head lower than the feet, empty the stomach, and apply external heat by means of hot-water bottles. If the patient vomit, do not let him change his position, but let him do it in a towel. Artificial respiration should be resorted to.

ALCOHOL.—*Effects:* Acute poisoning: The muscles are relaxed, the temperature low, and the patient falls into a deep comatose sleep with stertorous snoring. Chronic poisoning causes cirrhosis of the liver, mental symptoms, great nervous excitement, and disturbances of digestion. *Antidotes and Treatment:* For the acute poisoning apply external heat; also mustard-plasters to produce local irritation. The stomach should be emptied, and copious drafts of hot coffee administered. A cold application to the head, together with hot-water bags to other parts of the body, is advisable. If possible, keep the patient awake by shaking him, shouting, etc. Chronic poisoning must be treated by gradual diminution of the amount of alcohol taken, and later by complete withdrawal of the poison. The rest of the treatment must be directed by a physician; preferably in an institution making a specialty of nervous diseases.

ALKALIES (POTASSIUM, SODIUM, AND AMMONIA).—*Effects:* Burning sensations in the mouth, esophagus, and stomach, usually followed by vomiting. *Antidotes and Treatment:* Wash out the stomach with water which has been made slightly acid by the addition of vinegar, lemon-juice, tartaric or citric acid, etc. Give copious drafts of olive-oil, beaten white of eggs, milk, barley-water, etc. Pain may be relieved by opium or by injections of morphin.

AMYL NITRITE.—*Effects:* Fulness in the head, disturbances of sight, nervous depression, increased secretion of urine, irregular breathing, weak but rapid pulse, and, if the dose has been fatal, respiratory paralysis, causing death. Consciousness is usually undisturbed until the end. *Antidotes and Treatment:* Hypodermic injections of strychnin or atropin, stimulating drinks, cold douches alternating with hot, ice-bag to the head, and artificial respiration.

ANILIN DYES.—*Effects:* Slowly developing skin-eruptions, pallor, headache, muscular tremors, scattered areas of numbness over the body, sometimes bloody urine, respiratory disturbances, dizziness, and fainting. In case a large dose has been swallowed, the skin may become bluish, and be cold and clammy, while the weakness is very pronounced. *Antidotes and Treatment:* Wash out the stomach, or cause vomiting by giving the patient five grains of sulfate of copper which may be repeated within ten minutes if necessary. Artificial respiration, and the administration of oxygen are also advisable; and calcined magnesia should be given in a dose of one-half to one teaspoonful.

ANTIMONY (TARTAR EMETIC).—*Effects:* Depression of circulation, relaxation of muscles, profuse perspiration, nausea, pains in the stomach and intestines, vomiting, spasms of the diaphragm, and watery diarrhea; the temperature becomes lower than normal, and the pulse rapid and feeble; the body is cold and clammy, the face bluish, and cramps in the legs may occur. Death is sometimes preceded by skin-eruptions, some loss of sensation, fainting, and convulsive seizures. *Antidotes and Treatment:* Wash out

the stomach immediately. The antidote is tannic or gallic acid, given in solution, best as strong tea, to form an insoluble compound. Soothing drinks (such as flaxseed-tea, slippery-elm decoction, the white of eggs, and milk) should be given in large quantities. The heat must be maintained by warm blankets, hot-water bottles, etc.

ARSENIC.—*Effects:* Pains in the esophagus and abdomen, a sensation of strangulation, inability to swallow, vomiting, stools resembling those of Asiatic cholera, mucous discharges, etc. If death does not occur, skin-eruptions usually appear a few days later, and at the same time the previous symptoms sometimes subside, only to return in a few hours. Death is usually preceded by complete collapse and coma. *Antidotes and Treatment:* Use the stomach-pump or administer an emetic. The chemical antidote is hydrated oxid of iron in a dose of one ounce, repeated if necessary. It not only counteracts the arsenic, but also acts as a purgative. The white of eggs and stimulants may be freely administered.

ATROPIN.—See BELLADONNA.

BELLADONNA or ATROPIN (also HYOSCYAMUS, STRAMONIUM, and SOLANIN).—*Effects:* Dryness of the throat, pain on swallowing, and dilatation of the pupils. The face is often flushed, with white patches on the nose and at the corners of the mouth; the temperature becomes higher, the skin hot and dry, delirium may be present, and in some cases the patient may see double. An eruption resembling that of scarlatina appears, and may be followed by scaling; breathing is rapid, and so is the pulse. Death rarely occurs, because the poison is gradually eliminated from the body. *Antidotes and Treatment:* Give an emetic of mustard or of castile-soap-suds, or use the stomach-pump. Administer black coffee or tea by the mouth if the patient be able to swallow, otherwise in an enema. The nervous excitement may be counteracted by morphin or opium. Apply warm poultices to the feet, and give alternate douches of hot and cold water. Stimulants (whisky or brandy), and ammonia to the nostrils, as well as artificial respiration, are likewise indicated.

BENZIN.—*Effects:* This drug acts as a narcotic like chloroform or ether. *Antidotes and Treatment:* Empty the stomach by a strong emetic (mustard, ipecac, or sulfate of zinc) or by the tube. Let the patient have plenty of fresh air, and give a hypodermic injection of $\frac{1}{16}$ of a grain of atropin, or thirty drops of belladonna tincture by mouth. Give alternate douches of hot and cold water, and practise artificial respiration.

BROMIDES.—*Effects:* Skin-eruptions on the face, gradually spreading down the back until pustules appear. The patient becomes mentally depressed, slow and stupid, unable to evolve ideas or to give expression to thoughts. Digestion suffers, usually giving rise to constipation. *Antidotes and Treatment:* Stop administering the remedy, and give copious drafts of carbonated waters.

BROMIN.—*Effects:* Violent burning from the mouth down to the abdominal cavity, sometimes accompanied by vomiting or watery stools, and sometimes resulting in corrosion and perforation of the stomach. Death is usually preceded by complete collapse. *Antidotes and Treatment:* Ammonia water, well diluted, should be administered, together with soothing drinks. The body-heat must be maintained by external means, and opium or morphin administered to allay the severe pains.

CALABAR BEAN (PHYSOSTIGMA).—*Effects:* Vomiting, violent pains, difficulty of breathing, dizziness, extreme weakness, increased salivation, and contraction of the pupils of the eyes. There may be muscular tremors, followed by collapse, and slow pulse. The patient generally remains conscious until death occurs. Six seeds have been known to kill. *Antidotes and Treatment:* The stomach must be instantly evacuated by mustard, ipecac, sulfate of zinc, or the stomach-tube. Stimulants should be given, and artificial respiration practised. The urine must be voided by means of a catheter.

CAMPHOR.—*Effects:* Burning pains in the alimentary canal, followed by vomiting, sight-disturbances, weak pulse, great pallor, feebleness, and convulsions of an epileptiform character. The pupils are dilated; perspiration is increased, but urination is scanty. *Antidotes and Treatment:* The stomach should be evacuated speedily by means of the pump, or by an emetic of sulfate of zinc or mustard. Oily or alcoholic remedies should *not* be used. Alternate cold and hot douches, and maintenance of the body-heat by blankets, hot-water bottles, etc., constitute the further course of treatment.

CANNABIS INDICA.—See INDIAN HEMP; OPIUM.

CANTHARIDES (SPANISH FLY).—*Effects:* The swallowing of poisonous doses gives rise to burning sensations in the entire alimentary canal, and there is violent nausea and vomiting, blood often appearing in the vomitus. There may also be bloody and watery stools, suppression of urination, and violent inflammatory symptoms of the stomach and intestines. Half a dram of the powdered drug, or one ounce of the tincture usually causes death. *Antidotes and Treatment:* If vomiting has failed to occur, use the stomach-pump or administer an emetic, give soothing drinks (*no* milk) to allay inflammation of the mucous membranes, and administer opium to counteract the pain. Slippery-elm decoction, barley-water, flaxseed-tea, etc., are among the demulcents best adapted. Oils or oil emulsions must be strictly avoided, as they only aggravate the evil.

CARBOLIC ACID (PHENOL).—*Effects:* In large doses carbolic acid is often instantly fatal because it paralyzes the respiratory centers in the brain. In some cases, however, there may be vomiting, watery stools, violent inflammation of the stomach and intestines, and burning pain from the mouth down through the entire alimentary canal. The patient usually collapses, and the temperature falls below the normal, while the skin is pale, cold, and clammy. The pulse and the rate of breathing become rapid. The odor of

the drug and the telltale scar appearing on the mucous membrane of the mouth, are usually sufficient to establish a diagnosis. *Antidotes and Treatment:* The stomach must be carefully washed out; vomiting is not sufficient to empty it. Lime-water in large doses, and sulfate of sodium are the best antidotes. Flaxseed-tea, the white of eggs, and other demulcent drinks should be given to protect the inflamed membrane. Oils and glycerin should be avoided. Apply heat externally, and give whisky to stimulate the heart, and opium or morphin to relieve pain.

CARBON DISULFID.—*Effects:* Inhalation of the vapors causes headache, dizziness, and delirium, followed by paralysis, disturbances of vision, and some deafness. Taken internally it produces deep comatose sleep, feeble pulse, stertorous breathing, clammy skin, and a marked fall in temperature. *Antidotes and Treatment:* A mustard emetic should be given to empty the stomach; bromid of potassium, or chloral to quiet the nervous system; and ten drops of tincture of digitalis to stimulate the heart. The body must be kept warm, but a cold application to the head is grateful. Artificial respiration should also be resorted to.

CARBONIC ACID (and COAL-GAS).—*Effects:* In small quantities, depression of respiration and circulation, slow and weak pulse, later loss of consciousness. Larger quantities cause coma and death. *Antidotes and Treatment:* Plenty of fresh air, sprinkling with cold water on face and chest, artificial respiration. If the heart stops, light blows over the heart will sometimes renew its activity. Bloodletting, inhalation of ammonia vapors or oxygen, and strong black coffee are also advisable.

CASTOR-BEANS (RICIN; RICININ).—*Effects:* These beans contain a very active poison, and cases have been reported where as small a quantity as three seeds have caused death, with violent symptoms of inflammation of the entire intestinal tract, bladder, and kidneys. The pulse becomes small and frequent, cyanosis occurs, the temperature becomes subnormal, and there is profuse perspiration. *Antidotes and Treatment:* A strong emetic should be administered at once, and later soothing drinks should be given to allay inflammation, and opium to counteract the pain and violent purging.

CHLORAL HYDRATE.—*Effects:* An overdose causes failure of breathing, great weakness of the heart, and feeble pulse. The patient falls into a deep comatose sleep, and his skin becomes cold and clammy, and the temperature low; the color of the face is usually ashen gray. Chronic poisoning (the so-called "Chloral Habit") causes nervous disturbances bordering on insanity, and extreme physical deterioration. Sometimes also an eruption appears on the skin. *Antidotes and Treatment:* Empty the stomach with a pump or with a strong emetic of mustard, soap-suds, ipecac, etc. Arouse the patient by administering stimulants (coffee, caffeine, etc.), or by shaking or slapping him. Resort to artificial respiration. Two to three drops of a two per cent. solution of nitrate of strychnin should be given hypoder-

mically every fifteen minutes. The extremities must be kept warm by friction, hot-water bags, etc.

CHLORATES and NITRATES (of POTASSIUM, SODIUM, etc.).—Effects: These poisons exert their destructive action by destroying the blood. The earlier symptoms consist in pain in the head and abdomen, weakness, shortness of breath, and feeble pulse. *Antidotes and Treatment:* The stomach must be emptied immediately by means of a strong emetic, and copious drafts of water and mucilage given to dilute the poison. For the relief of pain, opium may be used. Amyl nitrite by inhalation is likewise of service, but stimulants that affect the kidneys should be avoided.

CHLOROFORM, ETHER, and NITROUS OXID GAS.—Effects: These drugs may produce death either by inhalation or when taken by mouth. They probably act by depressing the motor nerves supplying the blood-vessels, so as to cause complete paralysis of vital centers. They may also cause death by interfering with respiratory functions. When the drug is swallowed, the symptoms consist in colicky pains, bloody diarrhea, and vomiting. There are also manifestations of paralysis, sight disturbances, etc. *Antidotes and Treatment:* The drug should at once be withdrawn, the patient placed with his head lower than the rest of the body, and the tongue pulled forward so that it may not obstruct breathing. If the drug has been swallowed, the stomach should be washed out, preferably with milk or some other fatty fluid. Artificial respiration, and the use of the electric current with one pole at the throat and the other in the region of the stomach should be resorted to. Give amyl nitrite by inhalation in case of heart stoppage.

COAL-GAS.—See CARBONIC ACID.

COCAIN.—*Effects:* A poisonous dose of cocain causes ringing in the ears, loss of appetite, dryness of the throat, nausea, vomiting, muscular tremors, dizziness, flickering before the eyes, slow pulse, palpitation of the heart, pallor, and dilatation of the pupils. Breathing becomes irregular and shallow; sometimes spasmodic convulsions occur. All the special senses (sight, hearing, taste, and smell) are impaired or totally lost. Urination is usually increased. In the beginning the patient appears as under the influence of alcohol, but later he collapses completely. In the chronic form of the poisoning, great mental weakness and depravity are the most conspicuous symptoms. *Antidotes and Treatment:* A strong emetic followed by an intestinal astringent such as tannin, should be given first. Morphin is probably the best antidote; chloroform or chloral are also effectual. The heart weakness should be counteracted by giving inhalations of amyl nitrite. Artificial respiration may be necessary if other remedies fail.

CODEIN.—See OPIUM.

COLCHICUM (also COLOCYNTH).—Effects: An overdose, in the course of two to three hours, causes severe pains in the stomach, intestines, and kidneys, and sometimes diarrhea with bloody stools. There may be local areas of

anesthesia; and, usually following a severe headache, the patient collapses, with slow and weak pulse, irregular and labored breathing, cold and clammy skin, great muscular weakness, and, finally, complete paralysis of respiration causing death. *Antidotes and Treatment:* When a large dose has been swallowed, very little can be done for the patient; but if the dose has been only moderately large, there is some hope of recovery. If vomiting does not occur, one of the usual emetics (soap-suds, ipecac, mustard, etc.) should be given, or the stomach-pump used. The violent peristalsis should be checked by the administration of opium; and this should be followed by copious drafts of strong tea or coffee, and demulcent drinks, to counteract the intestinal irritation. The patient should be kept warm, and hot poultices to the abdomen are of great service.

COLOCYNTH.—See COLCHICUM.

CONIUM (POISON-HEMLOCK).—*Effects:* Soon after swallowing the drug, there is intense irritation in the mouth and esophagus. This is followed by nausea, vomiting, dizziness, great weariness, and often profuse perspiration. The pupils are enlarged, and sight and hearing interfered with. There is gradually increasing paralysis, interference with circulation, rapid and weak pulse, cold and pale skin, subnormal temperature. In some cases the predominating symptoms are maniacal delirium, followed by clonic or tetanic convulsions. Consciousness is usually not disturbed until the later stages have been reached. The alkaloid coniin is generally fatal in doses of one to two drops. *Antidotes and Treatment:* The stomach should be immediately emptied, the body-heat maintained by external means, and some solution containing tannin administered. A respiratory stimulant, such as strychnin, should be given, and artificial respiration resorted to if necessary. The rest of the treatment must be directed to the prevailing symptoms.

CONVALLARIA.—See DIGITALIS.

CROTON-OIL.—*Effects:* Profuse vomiting and purging, griping pains, collapse. *Antidotes and Treatment:* Empty the stomach, and administer twenty-drop doses of laudanum every twenty minutes until the violent symptoms subside. Demulcent drinks (mucilage, milk, olive-oil, etc.) should be given freely, together with alcoholic stimulants, or a small dose of spirit of camphor. Warm baths are also of great service.

CYTISIS.—See LABURNUM SEEDS.

DIGITALIS (also STROPHANTHUS, CONVALLARIA, and SCOPARIUS).—*Effects:* Nausea, vomiting, pain in the stomach, excessive weakness, fainting, and collapse. The pulse-rate varies from rapid to slow, and the slightest motion of the patient may cause the heart to act with such irregularity that instant death may occur. Where poisoning is due to accumulation (that is, following prolonged administration of otherwise safe doses), headache, nausea, flickering before the eyes, sleeplessness, and ringing or roaring in the ears are the predominating symptoms. *Antidotes and Treatment:* Empty the stomach

by means of an emetic or the pump, and then give the patient some strong tea or coffee, or about thirty grains of gallic acid and water. Five drops of tincture of aconite by the mouth, or a hypodermic injection of $\frac{1}{16}$ of a grain of nitrate of aconitin may give good results, in which case it should be repeated in about half an hour. The patient must be kept flat in bed, and not be allowed to move. Stimulants should be given frequently, by rectum if necessary. If poisoning is due to accumulation, opium is the best antidote, but should, of course, be administered only by a physician.

ERGOT.—*Effects:* Salivation, retching, vomiting, diarrhea, nervousness, headache, and dizziness. The stools are usually brownish, and the vomitus slimy. There is a feeling as of ants crawling over the limbs, the skin is generally cold and clammy, and there are disturbances of sight. In severe cases convulsions, delirium, and unconsciousness may occur. For the chronic variety of ergot-poisoning, see the article in volume I., page 312. *Antidotes and Treatment:* Empty the stomach by means of an emetic or the stomach-pump, and administer a drastic purgative such as one drop of croton-oil. After vomiting and purging, it is advisable to administer small doses of opium at intervals. The patient should remain in a reclining position and be kept warm. Massage may be given to increase circulation. Amyl nitrite is a recognized stimulant in this condition.

ETHER.—See CHLOROFORM.

GELSEMIUM and GELSEMIN.—*Effects:* Sensation of muscular weakness and relaxation, sometimes followed by pains; the skin becomes cold and clammy, the pulse feeble but rapid, and the patient wears an expression of great mental anxiety; the pupils of the eyes may be dilated, and the patient may see double. Breathing becomes slow and irregular, and death is due to failure of respiration. *Antidotes and Treatment:* The stomach must be promptly emptied, and ammonia, atropin, strychnin, or digitalis administered. Electricity may also be resorted to, and the patient must be kept awake by alternate douches of hot and cold water.

HELLEBORE.—See VERATRUM.

HYDROCHLORIC ACID.—*Effects:* Violent abdominal pains, corrosion of the stomach, inflammation of the peritoneum, great restlessness and thirst, and ineffectual attempts to vomit. In severe cases the patient collapses, has a temperature below the normal, and weak, running pulse. *Antidotes and Treatment:* Give large amount of alkalies (soap, wall-plaster, magnesia, sweet-oil, milk, mucilage, etc.) as an antidote. Morphin or opium may be given to relieve pain. In case of collapse, give stimulants freely, and apply hot-water bags to chest and feet.

HYOSCYAMUS.—See BELLADONNA.

INDIAN HEMP (CANNABIS INDICA).—The effects and treatment of this drug are similar to those mentioned under OPIUM (which see), but lime-juice or lemon-juice should be used in addition in the early stages.

IODIN.—*Effects:* Brownish discoloration and swelling of the mucous membranes of mouth and throat, intense irritation of the stomach and intestines, resulting in vomiting, diarrhea, and collapse. The vomitus is usually brown or, if the stomach contained starchy food, bluish. The extremities become cold, and the pulse small. In some cases severe headache, profuse flow of tears, and catarrh of the nose are important symptoms. *Antidotes and Treatment:* The stomach must be immediately washed out, and a copious quantity of starch mixed with hot water should be administered as an antidote. The iodine may be transformed into a harmless compound by administering the white of eggs, forming an albuminate. The patient may be stimulated by inhalations of amyl nitrite, and opium or morphin may be given to allay the pain.

LABURNUM SEEDS (CYTISIN).—*Effects:* Nausea and vomiting, convulsions resembling those of lockjaw, interference with breathing, and very much increased pulse. The throat is dry, the limbs weak, and the patient suffers from dizziness and great abdominal pains. Later he usually falls into a deep sleep. *Antidotes and Treatment:* The stomach should be promptly emptied by inducing vomiting, and this should be followed by an enema to wash out the bowels. Some stimulant may be given; and the patient should be aroused from his sleep by alternate douches of hot and cold water.

LAUDANUM.—See OPIUM.

LAUGHING-GAS.—See CHLOROFORM.

LEAD ACETATE and CHROMATE (also BARIUM COMPOUNDS).—*Effects:* Inflammation of the stomach and intestines, vomiting of white matter, and diarrhea with black stools. In some cases, however, constipation may occur instead of diarrhea. There are violent colicky pains, profuse perspiration, great weakness, pain in the limbs, small and irregular pulse, headache, vertigo, and paralysis of the extremities. The foul taste of the metal, and the grayish-white discoloration of the mucous membranes of mouth and throat are important aids in establishing a diagnosis. *Antidotes and Treatment:* The antidote is half an ounce of Epsom salt, or half a dram of diluted sulfuric acid. Before administering this the stomach should be washed out, or the antidote may be added to the water used for that purpose. Demulcent drinks, milk, etc., should be given freely. If choleriform spasms be present a hot poultice is grateful. For the symptoms and treatment of chronic lead-poisoning, see the article on lead-poisoning in the general vocabulary.

LIME, CHLORINATED.—*Effects:* Violent inflammation of the stomach and intestine, with nausea, vomiting, and diarrhea. If not immediately counteracted it may cause gangrene and perforation of the stomach. *Antidotes and Treatment:* Give white of eggs, oil, milk, or flour and water, and use opium and alcoholic stimulants in moderation.

LOBELIA.—*Effects:* Muscular weakness, nausea, vomiting, difficulty of breathing, cold and clammy skin, and temperature below the normal. If the dose has been large, death may occur, preceded by collapse or convulsive

seizures. A dose of sixty grains has been known to cause death. *Antidotes and Treatment:* Apply heat externally, administer stimulants, such as ammonia, to aid circulation, and allay pain and vomiting by small doses of opium. In some cases the patient fails to vomit, and in such instances vomiting must be induced, and astringents given later.

MATCHES.—See PHOSPHORUS.

MERCURY-COMPOUNDS.—*Effects:* An unpleasant metallic taste in the mouth, and a burning pain in the throat are the earliest symptoms. The tongue is swollen and grayish, and there is retching and vomiting of white, sometimes bloody, matter. The stools become first watery, later bloody, and are passed with painful frequency; their smell is most offensive. There is violent inflammation of the stomach and intestines, and suppression of urine by involvement of the kidneys; great abdominal pains prevail. The pulse is rapid (up to 150 per minute) but feeble, and the temperature becomes very low. *Antidotes and Treatment:* As soon as possible after the poison has been swallowed and the stomach emptied, administer the antidote, a large quantity of white of eggs, which forms an insoluble compound with the substance ingested. The pain and excessive vomiting may be allayed by doses of opium, and the temperature should be maintained by warm blankets, hot-water bottles, etc. When the danger is passed, administer Rochelle salt or Epsom salt to eliminate the insoluble mercury compound remaining in the alimentary canal.

MORPHIN.—See OPIUM.

MUSHROOMS, POISONOUS (MUSCARIN).—*Effects:* Impaired breathing, circulatory disturbances, nausea, vomiting, profuse flow of tears and saliva, and occasionally muscular symptoms; the skin is cold and clammy, and the pulse rapid but feeble. The patient usually passes into a comatose condition. *Antidotes and Treatment:* As soon as the stomach has been emptied, a large dose of atropin should be injected hypodermically (two to four drops of an ordinary solution), or twenty to thirty drops of belladonna may be given after the stomach has been evacuated. The patient should be kept warm by the aid of hot-water bottles; and after the more violent symptoms have passed, an enema and a dose of castor-oil should be given to remove remaining traces of the poison. Ordinary stimulants may be administered in small doses.

NICOTIN.—See TOBACCO.

NITRIC ACID.—*Effects:* In smaller quantities, burning pains in the mouth and esophagus, violent inflammation of the stomach and intestines, blood in stools and urine, followed by collapse. In larger quantities, instant death. *Antidotes and Treatment:* The antidote consists in large doses of alkaline solutions (white-wash, etc.); also sweet-oil and opium to relieve pain. The bodily heat must be maintained. The stomach-pump should not be used, as it may cause perforation of the wall of the esophagus or stomach.

NITROUS OXID.—See CHLOROFORM.

NUX VOMICA.—See STRYCHNIN.

OPIUM (LAUDANUM, MORPHIN, CODEIN) and CANNABIS INDICA.—

Effects: The first effect of a poisonous dose of opium or morphin is to cause a transitory feeling of well-being, whereupon the patient falls into a sleep which gradually becomes more and more profound. The pulse becomes slower and slower, the skin remains dry and hot, and the face is feverishly flushed. In later stages the face becomes blue, and the rate of breathing becomes lowered to ten or twelve per minute. The respiration becomes gradually shallower and slower, but the pulse is inclined to become very rapid as death approaches. The skin also changes from being hot and dry to becoming cold and clammy.

Antidotes and Treatment: A strong emetic or the stomach-pump should be used as early as possible. This may be difficult to accomplish, and for this reason the chemical antidote (potassium permanganate, or tannin) should be given in solution before any attempts are made to evacuate the stomach. Give a hypodermic injection of atropin ($\frac{1}{120}$ of a grain in solution), and administer strong black coffee to stimulate the heart. The electric current may be used to keep the patient awake, or sprinkling cold water in his face and over his chest or walking him up and down the floor may accomplish the same purpose. The bladder should be emptied frequently by means of a catheter, and it is also important to use the stomach-pump frequently to remove any traces of the drug excreted after absorption. Artificial respiration must be resorted to if necessary.

OXALIC ACID.—*Effects:* Burning pain in the throat and stomach, a sensation of strangulation, violent inflammatory symptoms in the stomach and intestines, vomiting of dark or bloody matter, collapse. The mucous membranes of mouth and pharynx are red and swollen, sometimes showing white patches of corrosion. One dram is the smallest dose recorded as fatal. *Antidotes and Treatment:* Give water mixtures of chalk or magnesia as an antidote, and empty the stomach either by an emetic or by the stomach-pump. In case of collapse, apply heat externally and administer respiratory stimulants, such as oxygen.

PHENOL.—See CARBOLIC ACID.

PHOSPHORUS (RAT-POISON and MATCHES).—*Effects:* Severe pain in the abdomen, vomiting, and collapse. Urination is scanty, and the vomitus is luminous when examined in the dark. Between twenty-four and thirty-six hours after the poison has been ingested, all the symptoms abate to such a degree that recovery seems certain, but in the course of a few hours they return with even greater violence than before. The vomitus resembles coffee-grounds, and death is almost inevitable. One grain of phosphorus usually results in death in from one to five days, and even one-tenth of a grain has proved fatal. Records show that a child has been killed by swallowing two match-heads. *Antidotes and Treatment:* After emptying the stomach

by means of the tube, or by administering three grains of sulfate of copper every five minutes until vomiting occurs, give the patient one dram of oxygenated oil of turpentine every half hour, either in mucilage or in water. Permanganate of potassium or peroxid of hydrogen also act as antidotes, but oils or fats should never be used as these aid in the absorption of the poison. It is important to empty the bladder at frequent intervals, since phosphorus is chiefly eliminated by the urine. Charcoal or lime-water may be given in large quantities to prevent destruction of tissues.

PHYSOSTIGMA.—See CALABAR-BEAN.

POISON-HEMLOCK.—See CONIUM.

POISON-IVY (RHUS TOXICODENDRON).—*Effects:* Externally the volatile acid from poison-ivy acts as a powerful irritant to the cutaneous tissues, producing intense itching and swelling, with heat, pain, and blister-formation; internally it gives rise to great thirst, burning pain in the throat and esophagus, dizziness, nausea, delirium, and convulsive seizures. The pulse is at first slow, but later becomes more rapid and irregular. An eruption of blisters may likewise appear on the skin. *Antidotes and Treatment:* For the external symptoms apply a saturated solution of acetate of lead in diluted alcohol to relieve the severe itching. Small doses of cocain are also effective. Internal remedies, such as coffee or opium, may be given to relieve the nervous symptoms.

RAT-POISON.—See PHOSPHORUS.

RHUS TOXICODENDRON.—See POISON-IVY.

RICIN and RICININ.—See CASTOR-BEANS.

SCOPARIUS.—See DIGITALIS.

SNAKE-BITES.—*Effects:* For the general symptoms see article on SNAKE-BITES in the main vocabulary. *Antidotes and Treatment:* The wound caused by the bite should immediately be sucked, or it may be advisable to cut out the flesh surrounding the wound, whereupon a solution of permanganate of potassium may be applied to it. In case of severe poisoning by the bite of a cobra, it is well to bleed the patient at one arm, at the same time transfusing blood to the other. Artificial respiration should be practised, and weak intermittent electric shocks given to the chest-walls. Ammonia by inhalation as well as by the mouth is also indicated. Specific antitoxins are known, and if procurable should be utilized.

SOLANIN.—See BELLADONNA.

SPANISH FLY.—See CANTHARIDES.

STRAMONIUM.—See BELLADONNA.

STROPHANTHUS.—See DIGITALIS.

STRYCHNIN (NUX VOMICA).—*Effects:* A poisonous dose of nux vomica or of its alkaloid strychnin gives rise to violent nervous symptoms, characterized especially by spasmodic convulsions, in which the body is thrown into a state of rigidity resembling that produced by lockjaw. The patient often

rests only upon his heels and the back of his head, assuming the so-called "bridge position." These seizures last from a few seconds to a minute or so, and are followed by complete exhaustion, every muscle being relaxed and flabby. Breathing is almost entirely stopped during the seizure, so that if this lasts long enough, death may occur from suffocation. There are no mental symptoms. Thirty grains of nux vomica have caused death, and half a grain of strychnin is usually rapidly fatal. *Antidotes and Treatment:* Produce vomiting immediately by a strong emetic, and use chloroform by inhalation, or half a dram of chloral, or one dram of bromid of potassium to counteract spasms. If breathing is suspended, give hypodermic injections of five to ten drops of amyl nitrite. Charcoal or tannin may be given in large doses, and the bladder should be emptied often.

SUBLIMATE, CORROSIVE.—See MERCURY COMPOUNDS.

TARTAR EMETIC.—See ANTIMONY.

TOBACCO (NICOTIN).—*Effects:* Nausea and vomiting, difficulty of breathing, relaxation of the muscles, vertigo, confusion of mind, weak pulse, sometimes passive convulsions. The continued abuse of tobacco may give rise to chronic laryngitis, loss of appetite, headache, and serious eye symptoms which may lead to total blindness. Fifteen to sixteen drops of nicotine kill in a few hours. *Antidotes and Treatment:* The stomach must be quickly washed out, preferably with a weak solution of tannin or with a solution of iodine (0.5 : 500). Let the patient drink plenty of water or lukewarm milk, keep him lying down, and apply warm applications to the body. Brandy or whisky may be given to stimulate.

TURPENTINE.—*Effects:* An overdose of oil of turpentine produces burning sensations in the stomach, tormenting thirst, muscular weakness, feeble and rapid pulse, dilatation of the pupils, and blueness of the face. There may be nausea and vomiting; and while there is usually some exhilaration of the mind in the early stages, unconsciousness almost invariably follows. Irritation of the kidneys and bladder results in scanty and painful urination, the urine frequently being voided only drop by drop and being mixed with blood. *Antidotes and Treatment:* The stomach must be promptly emptied either by the stomach-pump or by an emetic (mustard, ipecac, or sulfate of zinc). If there is no evacuation from the bowels, give an enema, and administer plenty of water and demulcent drinks to stimulate the kidneys. Hot applications should be applied to the loin.

UNKNOWN POISONS.—*Treatment:* Provoke repeated vomiting, give demulcent drinks, administer ordinary stimulants, and resort to artificial respiration if necessary. If the patient is cold, apply external heat in the shape of hot-water bags, etc.

VERATRUM (HELLEBORE).—*Effects:* This powerful poison generally produces vomiting when taken in too large doses, and for this reason it is not as frequently fatal as it would otherwise be, since a large part of the drug is

expelled before absorption can take place. It produces slow pulse, depresses the heart, and causes severe nervous symptoms. The patient complains of burning pain in the mouth, esophagus, and stomach; colicky attacks; and violent, sometimes bloody, diarrhea. Perspiration and urination are usually increased; the skin is cold and clammy, and devoid of sensation in various places. *Antidotes and Treatment:* Wash out the stomach, keep the patient flat on the bed, with his head somewhat lower than the rest of the body, and keep him warm by means of blankets, hot-water bags, etc. Administer large doses of hot coffee, either by mouth or rectum, and stimulate with alcohol, ammonia, etc. Resort to artificial respiration if necessary, and give turpentine to counteract the heart-symptoms. The electric current may also be of service.

ZINC SULFATE.—*Effects:* This drug being used as an emetic, fatal results rarely occur unless it is administered in enormous doses, since it seldom stays long enough in the stomach to be absorbed. If vomiting should not occur, abdominal pains, choleriform diarrhea, and general prostration set in. *Antidotes and Treatment:* Wash out the stomach and give plenty of warm water containing bicarbonate of soda or the white of eggs, both of which remedies form insoluble compounds with the zinc. Follow with demulcent drinks and plenty of milk, and apply hot poultices.

DOSE TABLES
OF DRUGS AND PHARMACEUTICAL PREPARATIONS, WITH
INDICATION OF THEIR USES IN MEDICINE

DOSE TABLES

OF DRUGS AND PHARMACEUTICAL PREPARATIONS, WITH INDICATION OF THEIR USES IN MEDICINE

CAUTION!—In the following tables are given the average doses ordinarily prescribed for *adults*. It should be borne in mind, however, that a great many factors—such as age, constitutional strength, mental or nervous anomalies, etc., etc.—in addition to the primary consideration of the prevailing affection, influence the physician's judgment when he prescribes medicinal treatment. Another factor that largely determines the advisability of increasing or decreasing the dose of any one drug, is the circumstance that it is usually necessary to combine various substances in one prescription; and a drug which, given alone, exerts one distinct action may, when compounded with other remedies, be so modified that its own specific efforts are entirely altered. Nor is there any means of tabulating the varying susceptibilities of different individuals to the same remedy. A dose which may kill one patient may cure another, and what may be an entirely safe prescription in one case of a disease may be extremely dangerous in another case of the very same affection. From this it may be clearly understood that such a table of doses as here presented merely gives the layman an idea concerning the varying strength of drugs as indicated by the difference in the size of doses prescribed; and the warning against experimenting with self-medication can not be made too emphatic. It must be understood that in no cases must the maximum dose be given at first, or, when given, be repeated more than two or three times a day.

The doses for children are purposely omitted, except in a very few instances, because all the factors that render caution necessary in the case of adults are greatly intensified in the case of children. As a matter of fact, even the experienced physician hesitates before prescribing drug treatment for a child, for he knows there are very great variations in the responsiveness of children to drug action.

The doses of solid drugs are indicated in drams and grains, those of liquids in drams and drops. An ounce (solid) is equal to eight drams; each dram is three scruples; and each scruple twenty grains. An ounce contains, therefore, 480 grains. The liquid ounce is likewise divided into eight drams, each equivalent to about one teaspoonful or sixty drops. A dessertspoonful is equal to two teaspoonfuls (or 120 drops), and a tablespoonful to four teaspoonfuls or half an ounce (240 drops). A wineglassful is two ounces, or four tablespoonfuls.

The following abbreviations have been used in dose columns :

<i>ad.</i> , adult.	(fl. extr.), fluid extract.
<i>ad. lib.</i> , ad libitum (at pleasure).	<i>hydr.</i> , hydragogue (causing watery evacuation of the bowels).
(alc.) alcohol, alcoholic.	<i>hyp.</i> , hypodermically (by introduction under the skin).
<i>antiper.</i> , antiperiodic (remedial of periodic diseases).	(infus.), infusion.
<i>antirheum.</i> , anti-rheumatic (remedial of rheumatism).	<i>lax.</i> , laxative (productive of gentle movements of the bowels).
<i>ap.</i> , aperient.	(lvs.), leaves.
<i>cath.</i> , cathartic.	(mucil.), mucilage.
<i>ch.</i> , children.	<i>purg.</i> , purgative (causing profuse evacuation of the bowels).
(decoct.), decoction.	(pwd.), powder.
(dil.), diluted.	<i>tæn.</i> , tænicide, destructive of tape-worms).
<i>diur.</i> , diuretic (stimulating the secretion of urine).	(tinct.), tincture.
<i>emet.</i> , emetic (productive of vomiting).	<i>verm.</i> , vermifuge (destructive of intestinal worms).
(emuls.), emulsion.	(vol. oil), volatile oil.
<i>expect.</i> , expectorant (promotive of expectoration).	
(extr.), powdered extract.	

DRUGS	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Aconite	Lobar pneumonia, asthma, tonsillitis, etc.				10-15
Allspice (Pimenta)	Flatulence, indigestion, colic, etc.				10-40
Aloes	Habitual constipation, retarded menstruation, menorrhagia, etc.				2-5
Aloin	Constipation				1
Alum	Gastralgia, dysentery, diabetes				5-30
Ammonium Benzoate	Cystitis, muscular rheumatism				60-120
Ammonium Bromid	Nervous diseases				10-30
Ammonium Carbonate	Respiratory and circulatory difficulties, surgical shock				2-10
Ammonium Chlorid	Liver disease, jaundice, neuralgia, sciatica, etc.				5-20
Ammonium Iodid	Scrofula, syphilis, gout, rheumatism, etc.				3-5
Ammonium Salicylate	Rheumatic fever, late stages of bronchitis, etc.				2-10
Ammonium Valerate	Nervousness, hysteria, St. Vitus's dance				2-10
Amyl Nitrite	Tonic convulsions, heart failure, etc. (by inhalation)		2-5		
Anemonin	As PULSATILLA				1-1 1/2
Augustura Bark ..	Dyspepsia, convalescence after acute febrile diseases, tropical dysentery, etc.				10-30
Anise	Flatulence, intestinal colic				10-20
Antipyrin	Migraine, sciatica, neuralgia, etc.				3-5
Apomorphin Hydrochlorid	Acute bronchitis, narcotic poisoning, chronic gastric catarrh				10-15
Arbor Vitæ	See THUJA				10

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Arbutin.....	As UVA-URSI.....				10-15
Arnica.....	See TINCTURE OF ARNICA.				
Arsenic Trioxid....	Pernicious anemia, leucorrhea, amenorrhea, asthma, rheumatoid arthritis, chronic malaria, dry scaly skin-diseases, etc.				$\frac{1}{16}$ - $\frac{1}{8}$
Arsenous Iodid....	As ARSENIC TRIOXID, but especially in eczema, lupus, leprosy, etc.				$\frac{1}{16}$
Asafetida.....	Chronic constipation, chronic bronchitis, nervous irritability, hysteria, etc.				3-10
Asclepias (Pleurisy-Root).	Early stages of pulmonary and bronchial affections.				20-60
Aspidium (Male Fern).	Tapeworm.....				30-60
Atropin Sulfate..	Eye diseases (by instillation).				
Balsam of Peru..	Bronchitis, laryngitis, asthma, etc.				5-15
of Tolu.....	Inflammations of the respiratory tract.				5-15
Barium Chlorid...	Weak heart.....				$\frac{1}{16}$ - $\frac{1}{8}$
Basham's Mixture.	See SOLUTION OF IRON AND AMMONIUM ACETATE.				
Bay Rum.....	See SPIRIT OF MYRCIA.				
Belladonna.....	Excessive perspiration, profuse urination, serous diarrhea, gall-stone colic, etc.		(tinct.) 8-20		(extr.) $\frac{1}{4}$
Benzoic Acid.....	Incontinence of urine, cystitis, etc.				10-30
Benzoin.....	Coryza, laryngitis, pharyngitis, etc. (by inhalation).				
Benzosol.....	See GUAIACOL BENZOATE.				
Berberis (Barberry).	Dyspepsia, dysentery, typhoid, enlargement of the spleen, etc.		(fl. extr.) 5-12		
Betanaphthol....	Gastric and intestinal fermentation				2-5
Bismuth and Ammonium Citrate.	Serous diarrhea, etc.				2-4
Bismuth Subgallate.	Diarrhea, dysentery; and locally in moist skin eruptions.				5-20
Bismuth Subnitrate.	Acute gastritis, serous diarrhea, vomiting due to gastric ulceration, etc.				10-60
Bismuth Subsalicylate.	Fermentative diarrhea, typhoid, etc.				2-20
Bittersweet.....	See DULCAMARA.				
Blackberry (Rubus).	As a tonic and intestinal astringent.				20-30
Black Haw.....	See VIBURNUM PRUNIFOLIUM.				
" Hellebore..	See HELLEBORE.				
" Lotion of Mercury.	Locally, as an astringent to venereal sores.				
Blistering Liquid.	Locally to produce vesication.				
Bloodroot (Sanguinaria).	Locally as a stimulant to indolent ulcers, etc. Internally as an expectorant in bronchitis, etc.		(tinct.) 10-40		1-5
Blue Mass.....	See MASS.				
Boneset.....	See EUPATORIUM.				
Borax.....	See SODIUM BORATE.				
Boric Acid.....	Cystitis due to alkalinity of urine, epilepsy, etc.				5-10
Bryonia.....	Weak conditions of stomach and intestine.	(tinct.) 1-2			20-60
Buchu.....	Catarrh of the bladder, incontinence and retention of urine, etc.	(fl. extr.) 1			
Buck-Bean.....	As a purgative, tonic, emmenagogue, emetic, and vermifuge.				$\left\{ \begin{array}{l} \text{tonic} \\ 10-30 \\ \text{emet.} \\ 20-60 \\ \text{lax.} \\ 5-15 \\ \text{purg.} \\ 20-40 \end{array} \right.$
Burdock.....	See LAPPA.				
Butternut.....	Constipation, dysentery, malarial affections.				
Cacao-Butter..	As a base for suppositories. Locally to allay irritation. Internally as a food.				
Caffein.....	Opium-poisoning, collapse, neuralgic headache, etc.				1-5
Calamus Root....	Dyspepsia (by chewing).				(ad. lib.)
Calcium Benzoate	As an internal antiseptic.....				10-30
" Borate....	Locally for moist eczema, burns, etc. Internally in diarrhea.				3-6
" Bromid..	Hysteria, insomnia, epilepsy, etc.				20-60
" Chlorid..	Scrofulous conditions, lupus, hemophilia, etc.				5-30

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Calcium Glycero-phosphate.	Neurasthenia, diabetes, incontinence of urine.				5-10
Calcium Hypo-phosphite.	Rickets, scrofula, dental caries, etc.				10-30
Calcium Iodid.....	Used rarely in pulmonary tuberculo-sis.				1-4
" Lactate....	Rickets, scrofula, etc.....				3-10
" Oxid.....	See LIME.				1-1½
" Perman-ganate.	As an internal antiseptic.....				10-30
Calcium Phos-phate, Precipi-tated.	As CALCIUM HYPOPHOSPHITE.....				8-20
Calcium Salicylate.	Inflammations of stomach and intes-tines.				1-5
" Sulfito...	Locally for ringworm, scabies, etc. Internally in fermentative dys-pepsia.				
Calomel.....	See MERCURY, MILD CHLORID OF.				10-30
Calumba.....	Atonic dyspepsia, nausea and vomit-ing, flatulent disorders, etc.				2-5 1 gr.
Cambogia (Gamboge).	Congestion of the liver, dropsy of the kidneys, uremia, tapeworm, etc.				4-10
Camphor.....	Internally in collapse, serous diar-rhea, coryza, cholera morbus, Asi-atic cholera, etc. Externally, in alcoholic solution, for sprains and bruises.	{ (spirit) 1-2			1-2
" Mono-bromated.	As CAMPHOR, and, in combination with other remedies, in head-ache.				2-5
Camphoric Acid..	Night-sweat of tuberculosis, cystitis, intestinal fermentation, etc.				10-30
Canella Bark.....	Atonic dyspepsia, uterine disorders, etc.				10-40
Cannabis Indica (Indian Hemp).	Distressing cough, pelvic neuralgia.	{ (fl. extr.) 1-10			{ (extr.) 1-1
Cantharides (Span-ish Fly).	Internally to stimulate urinary tract. Externally for vesication.	{ (tinct.) 1-5			
Capsicum (Bird Pepper).	Internally in flatulence, dyspepsia, delirium tremens, etc. Locally, as tinct., for chilblains, and, in plaster, for neuralgic and rheumat-ic pains.	{ (tinct.) 5-10			5-10
Caraway.....	Flatulent colic, griping, etc. See also OIL OF CARAWAY.				20-60
Carbolic Acid.....	See PHENOL.				
Cardamom.....	Dyspeptic disorders.....				5-15
Carron-Oil.....	See LINIMENT OF LIME.				
Cascara Sagrada..	As a laxative in habitual constipation.	{ (fl. extr.) 10-30			{ (extr.) 2-8 30
Cascarilla Bark..	Atonic dyspepsia, flatulence, diar-rhea, dysentery, etc.	{ (fl. extr.) 1-1			
Castanea (Ameri-can Chestnut).	Whooping-cough, respiratory trou-bles.	{ (tinct.) 1-2			
Castor-Oil.....	See OIL, CASTOR-.	{ (infus.) 1-4			5-30
Catechu.....	Diarrhea, spongy gums, hoarseness, etc.	{ (decoct.) 8			2-10
Catnep.....	Flatulent colic, hysteria, etc.....				
Cerium Oxalate...	Reflex vomiting, gastric acidity, etc.				
Cetraria (Iceland Moss).	Loss of appetite, inflammation of mucous membranes, etc.	{ (tinct.) 1-4			10-40
Cevadilla.....	See SABADILLA.				
Chalk.....	Gastric acidity, diarrhea, etc.	{ (infus.) 8-16	{ (tinct.) 3-10		
Chamomile.....	Diarrhea, colic, loss of appetite, con-valescence from acute fevers, etc.				1-4
Charcoal.....	Internally in fermentative dyspep-sia, sub-acute gastritis, etc. Ex-ternally, in poultice, for foul ul-cers, etc.				
Chaulmoogra.....	See GYNOCARDIA.				
Chelidonium.....	As a purgative and narcotic.....			1-2	{ (extr.) 5-15 20
Chenopodium.....	Worms.....	{ (vol. oil) 5-10			
Chiretta.....	Impaired digestion, liver troubles, etc.	{ (tinct.) 1-4			20
Chloralformamide.	Hysteria, insomnia, etc.....				20-40
Chloral Hydrate..	Nervous insomnia, reflex vomiting, etc.				5-20
Chlorinated Lime.	See LIME.				

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Chloroform.....	By inhalation to produce anesthesia, and, internally, in colic, abdominal pain, etc.	.....	3-5		
Chondrus (Irish Moss).	Bronchial and pulmonary affections.	{ (decoct.) 8			
Chrysarobin.....	Locally for skin diseases, and, in suppositories, for hemorrhoids.				
Cimicifuga (Black Cohosh).	Headache due to eye-strain, St. Vitus's dance, etc.	{ (tinct.) 1-2	{ (fl. extr.) 10-30		{ (extr.) 1-5 5-15 10-20
Cinchona.....	Malaria, intermittent fevers, etc.				{ tonic 1-2 antiper. 15-30
Cinchonidin.....	Malaria, etc.				
Cinchonin.....	Debility, intermittent fevers, etc.				
Cinnamon.....	Nausea, vomiting, flatulence, diarrhea, etc.		{ (oil) 1-3		
" Water..	Flatulent colic, etc.	1-4			
Cloves.....	As an aromatic stimulant in gastric flatulence, etc.		{ (tinct.) 20-60		5-10
Cocain.....	To produce local anesthesia. Used in a 1-per-cent. solution for instillation or injection.				
Cochineal.....	Whooping-cough, hiccup, neuralgia, etc.		{ (tinct.) 30-60		
Cod-Liver Oil.....	See OIL, COD-LIVER.				
Codein.....	To relieve pain, coughing, etc.				$\frac{1}{2}$ -2
" Sulfate.....	Nervous irritability, local pain, etc.				$\frac{1}{2}$ -2
Cola.....	Heart troubles, migraine, neuralgia, fatigue, etc.				20-40
Colchicin.....	Gout, rheumatism, myalgias, etc.				1 $\frac{1}{2}$ -1 $\frac{1}{2}$
Cold-Cream.....	See OINTMENT OF ROSE WATER.				
Colic Root.....	See DIOSCOREA.				
Collodion.....	Externally to protect cuts, bruises, etc.				
Colocynth.....	To relieve constipation.				2-10
Coltsfoot.....	As a demulcent and tonic in bronchial and pulmonary affections.	{ (decoct.) 4-8			
Compound Licorice Powder.	See POWDER, COMPOUND, OF LICORICE.				
Confection of Pepper.	Hemorrhoids, anal fistulae, rectal ulcers, etc.	$\frac{1}{2}$ -1			
Confection of Senna.	Constipation, hemorrhoids, etc.	1-2			
Confection of Sulfur.	Constipation in the presence of hemorrhoids.	1-2			
Coniin Hydrochlorid.	As CONIUM.....				$\frac{1}{2}$ -1
Conium (Poison Hemlock).	Melancholia, heart troubles, liver engorgement, tetanus, mania, scrofulous ophthalmia, etc.		{ (fl. extr.) 2-6		{ (pw.lvs.) 2-6 (extr.) $\frac{1}{2}$ -1
Convallamarin....	As CONVALLARIA.....				$\frac{1}{2}$
Convallaria.....	Heart troubles and respiratory difficulties.		{ (fl. extr.) 4-8		
Copaiba.....	Cystitis, gonorrhea, urethritis, etc.		15-60		1 $\frac{1}{2}$ -2 $\frac{1}{2}$
Copper Arsenite..	Anemia, debilitated mucous membranes.				1 $\frac{1}{2}$ -1
" Nitrate.....	Nervous affections.				$\frac{1}{2}$
" Subacetate.	Locally to sluggish ulcers, warts, etc.				20-60
" Sulfate.....	Nervous affections.				
Coriander.....	As a digestant.				
Cornus.....	A mild astringent.		{ (fl. extr.) 15-60		
Corrosive Sublimate.	See MERCURY BICHLORID.				
Cottonroot Bark..	Emmenagogue.	{ (decoct.) 16	{ (fl. extr.) 30-60		
Cramp Bark.....	See VIBURNUM OPULUS.				
Creosote.....	Pulmonary affections, obstinate vomiting, etc.		1-20		
Cresol.....	Locally as a dressing and as an antiseptic wash. Internally for gastric irritability, etc.		1-2		
Cubebs.....	Gonorrhea, cystitis, enuresis, bronchitis, etc.		{ (vol. oil) 10 (vol. oil) 1-3	1-3	
Cumin.....	Gastric and intestinal complaints.			$\frac{1}{2}$ -1	
Curare.....	Convulsive seizures.				$\frac{1}{16}$ - $\frac{1}{8}$
Curarin.....	As CURARE				1 $\frac{1}{2}$

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Cusparia.....	See ANGUSTURA.				
Cusso.....	Tapeworms.....	{ (fl. extr.) 4			
Cypripedin.....	As CYPRIPEDEUM.....				$\frac{1}{2}$ -3
Cypripedium.....	Nervous disorders (hysteria, St. Vitus's dance, etc.).				15
Damiana.....	Sexual impotence, etc.....		{ (fl. extr.) 30		
Dandelion (Taraxacum).....	Atonic dyspepsia, torpid liver, catarrhal jaundice, etc.	{ (fl. extr.) 1-8			{ (extr.) 5-20
Dermatol.....	See BISMUTH SUBGALLATE.				
Diastase.....	Indigestion, dyspepsia, etc.....				2-5
Digitalin.....	As DIGITALIS.....				15-20
Digitalis.....	Diseases of the heart valves, cardiac failure, dropsy, pneumonia, etc.		{ (tinct.) 5-20 { (fl. extr.) 1-5		$\frac{1}{2}$ -1
Dioscorea.....	Bilious colic, muscular rheumatism, etc.		{ (fl. extr.) 10-40 { (fl. extr.) 5-10		
Dipteryx (Tonka Bean).....	Whooping-cough, flatulent colic, diarrhea, etc.				
Donovan's Solution.....	See SOLUTION OF ARSENOUS AND MERCURIC IODID.				
Dover's Powder.....	See POWDER OF IPECAC AND OPIUM.				
Dracontium.....	Chorea, hysteria, spasmodic asthma, etc.	{ (tinct.) 1-2			10-20
Drosera (Sundew).....	Chronic bronchitis, whooping-cough, etc.		{ (tinct.) 5		
Dulcamara (Bittersweet).....	Locally and internally for eczema, acne, etc.	{ (decoct.) 8-16	{ (fl. extr.) 30-60	$\frac{1}{2}$ -1	
Elaterium.....	To produce watery stools in dropsy, brain congestion, etc.				$\frac{1}{16}$ - $\frac{1}{8}$
Elaterium.....	As ELATERIUM.....				$\frac{1}{2}$
Elder Flowers.....	Applied locally (in infusion, ointment, or poultice) to sores, hemorrhoids, blisters, etc.				
Elecampane.....	Chronic lung troubles, typhoid, menstrual disorders, etc.				10-30
Elixir of Iron, Quinin, and Strychnin.....	Convalescence after exhausting diseases, nervous debility, etc.	1-2			
Elm.....	See SLIPPERY ELM.				
Emetin.....	As IPECAC.....				$\frac{1}{2}$
Emulsion of Almond.....	As a demulcent in inflammations of the respiratory tract, intestinal and urethral irritations, etc.	32-64			
Emulsion of Asa-fetida.....	As ASAFETIDA, and as an enema in tympanites.	2-8			
Emulsion of Chloroform.....	Flatulent colic, nervous conditions, etc.	4-8			
Emulsion of Cod-Liver Oil.....	Impaired nutrition, rickets, anemia, tuberculosis, etc.	1-4			
Emulsion of Oil of Turpentine.....	Inflammations of the genito-urinary tract, enuresis, sexual impotence, etc.	1-4			
Epsom Salt.....	See MAGNESIUM SULFATE.				
Ergot.....	To arrest hemorrhage after childbirth, and in the treatment of vertigo, etc.	{ (fl. extr.) $\frac{1}{2}$ -2			{ (extr.) $\frac{1}{2}$ -1
Erythrophlein.....	Spasmodic asthma, heart-diseases, etc.				$\frac{1}{16}$ - $\frac{1}{8}$
Eserin.....	See PHYSOSTIGMIN.				
Eucain.....	To produce local anesthesia by injection, instillation, etc.				
Eucalyptol.....	As an antiseptic dressing to foul ulcers; and, internally, in bronchial and pulmonary inflammations, etc.		5-10		
Eucalyptus.....	Migraine, neuralgia, asthma, bronchitis, gonorrhea, etc.	{ (fl. extr.) $\frac{1}{2}$ -2	{ (oil) 10-20 8-30		
Eugenol.....	Internally in flatulence, griping, cough, etc. Locally as an anesthetic and counter-irritant.				
Euonymin.....	As EUONYMUS.....				$\frac{1}{2}$ -1
Euonymus.....	Liver troubles, constipation, etc.		{ (fl. extr.) 30		3-10
Eupatorium (Boneset).....	Colds, sore throat, influenza, etc.	{ (infus.) 8-16	{ (fl. extr.) 20-30		20-30

EXTRACTS. Powdered extracts of various drugs, which are official in the Pharmacopœias of the United States and Great Britain, are used as are the substances themselves. For this reason only the doses are given.

DRUG	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Fel Bovis (Ox-Gall).	Dyspepsia, constipation, liver troubles, worms, etc.				5-10
Fennel	Flatulence, griping, retarded menstruation and lactation, etc.				10-30
" Water	Flatulence.....				
Flaxseed	As a demulcent in inflammatory conditions of mucous membranes.	{ 1 (infus.) 80			

FLUID EXTRACTS. Like powdered extracts, these preparations are indicated in the same conditions for which the substances themselves are prescribed. Reference should therefore be made to the different headings.

Only the doses are here given.

Fluid Extract of	Drops	Fluid Extract of	Drops
Aconite.....	1-1	Hydrastis.....	30-120
" of Belladonna Root.....	1-2	" of Hyoscyamus.....	5-10
" of Berberis.....	2-5	" " of Ipecac.....	expect. 2-5 emet.
" of Blackberry Bark.....	30-120	" " of Krameria.....	10-30
" of Buchu.....	30-60	" " of Lappa.....	20-60
" of Calamus.....	5-20	" " of Licorice.....	30-60
" of Calumba.....	10-60	" " of Lobelia.....	60-120
" of Cannabis Indica.....	1-1	" " of Lupulin.....	expect. 1-5 emet.
" of Capsicum.....	1-2	" " of Matico.....	10-20
" of Chirata.....	15-30	" " of Mezereum.....	30-120
" of Cimicifuga.....	30-60	" " of Nux Vomica.....	5-10
" of Cinchona.....	30-60	" " of Pareira.....	1-5
" of Coca.....	30-60	" " of Pilocarpus.....	60-120
" of Colchicum.....	2-8	" " of Podophyllum.....	10-30
" of Conium.....	2-5	" " of Quassia.....	5-20
" of Convallaria.....	3-15	" " of Quercus.....	15-30
" of Cubebs.....	15-40	" " of Rhamnus Purshiana..	15-60
" of Digitalis.....	1-2	" " of Rhubarb.....	15-30
" of Ergot.....	30-120	" " of Rhus Glabra.....	15-30
" of Eucalyptus.....	5-15	" " of Sanguinaria.....	3-5
" of Euonymus.....	60-120	" " of Sarsaparilla.....	30-60
" of Eupatorium.....	60	" " of Savin (used also externally in ointment).	5-10
" of Frangula.....	10-30		
" of Gelsemium.....	1-3		
" of Gentian.....	10-30		
" of Ginger.....	5-20		
" of Granatum.....	20-30		
" of Grindelia.....	30-60		
" of Guarana.....	30-120		

	Drops		Drops
Fluid Extract of Scopol. (For uses see	1-5	Fluid Extract of Taraxacum.....	30-60
" " of BELLADONNA.)		" " of Triticum.....	120-240
" " of Senega.....	2-10	" " of Uva-Ursi.....	30-60
" " of Senna.....	30-120	" " of Valerian.....	30-60
" " of Serpentaria.....	15-30	" " of Veratrum.....	1-2
" " of Spigelia.....	30-120	" " of Viburnum Opulus.....	15-60
" " of Squill.....	2-3	" " of Viburnum Prunifolium	30-60
" " of Stillingia.....	15-30	" " of Wich-Hazel.....	10-30
" " of Stramonium.....	1-2	" " of Wild Cherry.....	15-60
" " of Sumbul.....	15-45	" " of Xanthoxylum.....	240-480

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Powder's Solution.	See SOLUTION OF POTASSIUM ARSENITE.				
Frangula.....	Habitual constipation, dropsy, etc..	{ (decoct.)	{ (fl. extr.)		
Fuller's Earth....	See KAOLIN.	4	20		
Galangal.....	Indigestion, flatulence, etc.....	{ (tinct.)			20-30
Galbanum.....	Locally, as plaster, to produce counter-irritation and blistering. Internally in chronic inflammations of the bronchi and of the genito-urinary tract.	1			10-20
Galla (Nutmeg)...	Locally, in ointment, for hemorrhoids, prolapse of the rectum, sluggish ulcers, etc.; in tincture as an astringent application in sore throat, etc. Rarely internally in gastric and intestinal diarrheas.			1-1	
Gallic Acid.....	Hematuria, hemoptysis, night-sweat of tuberculosis, etc.				5-20
Gambir (Pale Cat-echu).	As CATECHU.				
Gamboge.....	See CAMBOGIA.				
Gaultheria.....	See OIL OF WINTERGREEN.				
Gelatin.....	Locally and internally to check bleeding.				
Gelsemin Hydro-chlorid.	As GELSEMIUM.....				ss
Gelsemium.....	Nervous conditions, asthma, whooping-cough, spasmodic affections, migraine, etc.		{ (fl. extr.) 2-5 (tinct.) 5-15		
Gentian.....	Loss of appetite, indigestion, malaria, gastric and intestinal catarrhs of children.				10-30
Geranium.....	Diarrhea, internal hemorrhages, etc.	{ (fl. extr.)			20-40
German Chamomile.	As CHAMOMILE.	1-1			
Gillenia.....	As an emetic, purgative, and tonic.				{ 2-5 emet. 20-30 10-30
Ginger (Zingiber).	Internally in abdominal cramp, flatulence, etc. Externally, in poultices, to relieve headache, neuralgia, muscle pains, etc.	{ (tinct.)			
Glucose.....	Dropsy.....	48			
Glycerin.....	By mouth or rectum as a laxative...	{ 1-2 enema 2-4			
Glycerite of Borax	Locally in thrush, inflammation of the mouth, erysipelas, etc.				
" of Iron, Quinin and Strychnin.	As SIRUP OF IRON, QUININ, AND STRYCHNIN.		15-60		
Glycerite of Phenol.	As PHENOL.....		5-10		
Glycerite of Starch	Locally for burns, inflammatory skin-diseases, etc.				
Glycerite of Tannic Acid.	Serous diarrhea, vaginal leucorrhea, hemorrhages, etc.		10-30		
Glycyrrhiza.....	See LICORICE.				
Glycyrrhizin.....	As LICORICE.....				5-15
Gold and Sodium Chlorid.	Sexual impotence, late stages of syphilis.				ss
Gossypii Cortex...	See COTTONROOT BARK.				
Goulard's Extract	See SOLUTION OF LEAD SUBACETATE.				

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Granatum.....	See POMEGRANATE.				
Griffith's Mixture.	See MIXTURE OF COMPOUND IRON.				
Grindelia.....	Internally in asthma, bronchitis, whooping-cough, catarrh of the bladder, etc. Locally for skin-diseases, burns, etc.		{ (fl. extr.) 20-60		
Guaiac.....	Rheumatism, gout, tonsillitis, etc.		{ (tinct.) 10-60		{ (resin) 10-30
Guaiacol.....	Locally in tonsillitis and over neuralgic areas, etc. Internally as an intestinal antiseptic and febrifuge.		2-10		
Guaiacol Benzoate	Tuberculosis of the lungs.....				4-8
Guaiacol Carbonate.	Bronchitis, tuberculosis, typhoid, indigestion, etc.				2-10
Guaiacol Salicylate.	Intestinal fermentation.....				15-30
Guarana.....	Neuralgia, headache, etc.			1-2	
Gynocardia..... (Chaulmoogra).	Externally in leprosy, syphilitic skin eruptions, etc. Internally in muscular rheumatism, tuberculosis, etc.		{ (oil) 2-6		
Hamamelis.....	See WICH-HAZEL.				
Hedera.....	See PENNYROYAL.				
Hellebore, Black..	As a hydragogue cathartic and alterative.				{ 1-2 powd. 10-15
" Green.....	See VERATRUM.				
Henbane.....	See HYOSCYAMUS.				
Heroin Hydrochlorid.	Bronchitis, emphysema, tuberculosis, uremia, etc.				1-1½
Hexamethylenamin.	Kidney-troubles, gonorrhea, typhoid, etc.				3-10
Hoarhound.....	Chronic bronchitis, menstrual disorders. Also as a laxative.	{ (infus.) 32			
Hoffmann's Anodyne.	See SPIRIT OF ETHER, COMPOUND.				
Homatropin Hydrobromid.	By instillation into the eye for surgical purposes.				
Honey (Mel).....	Used like sirup as a vehicle; also locally, with borax, in thrush, stomatitis, etc.				
" and Vinegar.	See OXYMEL.				
Hops (Humulus)...	Nervousness, general debility, delirium tremens, hysteria, enuresis, etc.	{ (tinct.) 1-3			
Horse Chestnut...	Malaria, whooping-cough, etc.....	{ (decoct.)			
Humulus.....	See HOPS.	{ 4			
Hydrangea (Seven-Barks).	Gall-stones, renal gravel, etc.....	{ (fl. extr.) 1			
Hydrastin.....	By injection for gonorrhea, vaginal and uterine catarrhs, etc. Internally for gastro-intestinal catarrhs, etc.				1-1
Hydrastis.....	Rhinitis, intestinal catarrhs, leucorrhea, gonorrhea, etc.	{ (tinct.) 1-2	{ (fl. extr.) 5-10 5-40		
Hydriodic Acid, Diluted.	Scrofula.....				
Hydrochloric Acid.	Syphilis, intestinal catarrhs, etc....		{ (dil.) 5-10 2-3		
Hydrocyanic Acid, Diluted.	Gastralgia, vomiting, coughing of consumptives.				
Hydrogen Peroxid	By local application in diphtheria, tonsillitis, ulcers, etc.				
Hyoscin Hydrobromid.	Nervous excitement, mania, morphinism, etc.				1½-16
Hyoscyamin Hydrobromid.	By instillation into the eye to dilate the pupil. Internally to check excessive urination, perspiration, and salivation.				½
Hyoscyamin Sulfate.	As HYOSCYAMIN HYDROBROMID.....				½
Hyoscyamus..... (Henbane).	Nervous complaints, whooping-cough, gastric ulcer, etc.	{ (tinct.) 1-2			{ (alc. extr.) 1-2 (extr.) 5-10
Iceland Moss..	See CETRARIA.				
Ichthyol.....	As ointment, in erysipelas, articular rheumatism, chronic skin-diseases, chilblains, frost-bites, etc. Internally in tuberculosis, etc.				2-10
Illicium.....	Flatulent colic, dyspepsia, etc.....				10-20

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Indian Hemp.....	See CANNABIS INDICA.				
Indigo.....	Nervous and menstrual disorders.				5-20
Infusion of Angu- stura.	Dyspepsia, etc.....	8-16			
Infusion of Bear- berry.	As a diuretic.....	8-16			
Infusion of Broom	As SCOPARIUS.....	8			
Infusion of Buchu	Diuretic.....	8-16			
Infusion of Casca- rilla.	Dyspepsia, flatulence, diarrhea, etc.	16			
Infusion of Chir- etta.	Simple bitter.....	8-24			
Infusion of Cin- chona, Acid.	Tonic.....	8-16			
Infusion of Cloves	Nausea, flatulence, colic, etc.....	4-16			
Infusion of Digita- lis.	As DIGITALIS.....	2-4			
Infusion of Ergot.	As ERGOT.....	8-16			
Infusion of Gen- tian, Compound.	Bitter tonic.....	4-8			
Infusion of Hops..	Nerve sedative.....	8-16			
Infusion of Kram- eria.	Astringent.....	8-16			
Infusion of Orange Peel.	Tonic.....	8-16			
Infusion of Quas- sia.	As a bitter tonic, and, by injection, for the expulsion of tapeworms.	8-16			
Infusion of Rhu- barb.	Mild laxative.....	8-24			
Infusion of Roses, Acid.	Night-sweats, etc.....	16-32			
Infusion of Senega	Expectorant.....	8-16			
Infusion of Senna, Compound.	As SENNA; less griping.....	16-32			
Infusion of Serpen- taria.	Chronic dyspepsia.....	8-16			
Infusion of Uva- Ursi.	See INFUSION OF BEARBERRY.				
Infusion of Wild Cherry	Nervous cough, tuberculosis, etc....	16-24			
Modia.....	Externally as a counter-irritant in inflammatory conditions. Rarely used internally.				
Iodoform.....	As a local dressing for syphilitic sores, inflamed hemorrhoids, anal fissures, etc. Internally for chron- ic gastric and intestinal cat- arrhs, etc.				1-3
Iodol.....	As IODOFORM; also in diabetes, syphilis, etc.				2-5
Ipecac.....	To induce vomiting and to check reflex vomiting. Also in bron- chitis, etc. (See also SIRUP OF IPECAC.)				1-1 emel. 20
Iridin.....	As IRIS.....				2-4
Iris (Blue Flag)...	To stimulate the liver.....				10-20
Irish Moss.....	See CHONDRUS.				
Iron Albuminate..	Anemia, chlorosis, etc. . .				5-20
Iron and Ammo- nium Citrate.	As IRON CITRATE.....				2-5
Iron and Ammo- nium Sulfate.	Diarrhea with anemia, etc.....				5-10
Iron and Ammo- nium Tartrate.	Mild astringent.....				10-30
Iron Arsenate.....	As ARSENIC.....				1-1
" Chlorid.....	See TINCTURE OF IRON CHLORID.				
" Citrate.....	Anemia, chlorosis, etc.....				3-10
" Hydroxid.....	Antidote in arsenic-poisoning.....				ad. lib.
" " with Magnesium Oxid	As IRON HYDROXID.....				ad. lib.
Iron Hypophos- phite.	Anemia associated with nervous de- pression.				5-10
Iron Iodid.....	As SIRUP OF IRON IODID.....				3-5
" Lactate.....	Chlorosis.....				1-20
" Peptonate.....	Anemia, chlorosis, etc.....				3-10
" and Potassi- um Tartrate.	Anemia, chlorosis, hemophilia, gen- eral debility, etc.				5-10
Iron and Quinin Citrate.	In convalescence after acute diseases, intermittent fevers, etc.				5
Iron, Saccharated, Oxid of.	Anemia, debility, etc.; also as anti- dote in arsenic-poisoning.				3-10

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Iron Salicylate...	Diarrhea, rheumatism, intestinal fermentation, etc.	.....	.....	.....	3-10
Iron, Soluble Phosphate of.	Menstrual disorders, anemia with indigestion, etc.	.....	.....	.....	5-10
Iron, Soluble Pyrophosphate of.	Anemia, chlorosis, menstrual disorders, hemophilia, etc.	.....	.....	.....	2-5
Iron and Strychnin Citrate.	Nervous debility, anemia, etc.	.....	.....	.....	3-5
Iron Sulfate.....	Leucorrhea, menorrhagia, hemorrhages from the stomach and intestine, gastric ulcer, etc. Locally for erysipelas, eczema, etc.	.....	.....	.....	1-2
Iron Valerianate..	Chlorosis with hysteria.....	.....	.....	.....	1-3
Jalap	As a hydragogue cathartic in dropsy, cerebral congestion, etc.	.....	.....	.....	} <i>purg.</i> 5 <i>hydr.</i> 15-20
Juniper.....	Chronic inflammations of the genito-urinary tract, albuminuria, Bright's disease, etc. 1 pint of infusion daily.	.....	.....	.....
Kamala	Tapeworms and roundworms.....	} (tinct.) 1-4	.....	.....	.....
Kaolin (Fuller's Earth).	As a dusting-powder in eczema, etc.	.....	.....	.....	.....
Kava.....	By subcutaneous injection to produce local anesthesia. Internally in diarrhea, cystitis, leucorrhea, etc.	.....	} (fl. extr.) 10-60	.....	.....
Kino.....	Diarrhea, dysentery, diabetes, intestinal hemorrhage, etc.	} (tinct.) 1	.....	.....	10-20
Krameria.....	Internally in diarrhea, leucorrhea, etc. Locally to sore nipples, and in rectal injections for anal fissures, etc.	} (tinct.) 1-2	.....	.....	10-30
Kumiss.....	See MILK, FERMENTED.	.....	.....	.....	.....
Lactucarium ...	Nervous disorders in children.....	.....	.....	.....	1-2
Laughing Gas.....	See NITROUS OXID.	.....	.....	.....	.....
Lappa (Burdock)	Gout, rheumatism, scrofula, syphilis, etc. (2 pints of decoction daily).	.....	.....	.....	.....
Laudanum.....	See TINCTURE OF OPIUM.	.....	.....	.....	.....
Lavender.....	See OIL OF LAVENDER.	.....	.....	.....	.....
Lead Acetate.....	Internally in serous diarrhea, dysentery, etc. By injection (of solution) in gonorrhea, leucorrhea, etc. Also locally in certain skin irritations.	.....	.....	.....	1-3
" Iodid.....	In ointment for indolent ulcers, etc. Internally in scrofula, etc.	.....	.....	.....	1-2
" Nitrate.....	In solution as a local application to cracked nipples and lips, chapped hands, etc.	.....	.....	.....	.....
" Oxid.....	In combination with sweet-oil as a local application to superficial burns, etc.	.....	.....	.....	.....
Lemon Juice.....	As a beverage in febrile diseases, and as a preventive and remedy for scurvy.	.....	.....	.....	.....
Leptandra.....	Chronic constipation, torpid liver, etc.	.....	.....	.....	20-60
Levisticum (Lavage).	Flatulence, dropsy, etc.	} (infus.) 2-4	.....	.....	.....
Licorice.....	Sore throat, catarrhs of the genito-urinary and intestinal tracts, etc. See also POWDER, COMPOUND, OF LICORICE.	} (fl. extr.) 1-2	.....	.....	.....
Lime, Chlorinated.	Externally, in ointment, for sluggish ulcers, etc. Internally in low fevers, chronic bronchitis, sewer-gas poisoning, etc. Largely as a disinfectant.	.....	.....	.....	1-5
" Sulfurated..	Locally, in solution, for the itch, ringworm, etc. Internally in suppurative inflammations.	.....	.....	.....	10-1
Liniment of Aconite.	Local pains, superficial neuralgias, etc.	.....	.....	.....	.....
Liniment of Ammonia.	Rheumatic and neuralgic pains, and to abort beginning inflammations.	.....	.....	.....	.....
Liniment of Belladonna.	Pains of rheumatism, neuralgia, etc.	.....	.....	.....	.....

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Liniment of Camphor.	Sprains, bruises, rheumatic pains, glandular swellings, etc.				
Liniment of Camphor, Ammoniated.	For the relief of pain and to cause counter-irritation.				
Liniment of Chloroform.	Locally for the relief of acute pain.				
Liniment of Croton-Oil.	To produce blistering.				
Liniment of Lime.	Burns, scalds, etc.				
Liniment of Mercury.	To aid in the resolution of swellings, syphilitic tumors, etc.				
Liniment of Mustard.	To produce blistering and counter-irritation.				
Liniment of Opium.	Sprains, rheumatic pain, etc.				
Liniment of Soap.	As a basis for other ingredients.				
Liniment of Turpentine.	Burns, scalds, frost-bites, erysipelas, etc.				
Linseed.....	See FLAXSEED.				
Lithium Benzoate.....	As BENZOIC ACID.....				15-30
" Bromid.....	As a palliative in nervous irritability, epilepsy, etc.				10-30
" Carbonate	To render an acid urine alkaline, and in arthritis, diabetes, rheumatism, etc.				5-15
" Citrate.....	As LITHIUM CARBONATE.....				10-20
".....	A convenient and pleasant form of administering lithium citrate.			1-2	
Effervescent.	As SALICYLIC ACID.....				40-60
Lithium Salicylate.					
Lobelia.....	To produce vomiting, and as an expectorant in spasmodic asthma, whooping-cough, croup, etc.	{ (tinct.) emet. 1-2	{ (tinct.) expect. 10-20		
Logwood (Hæmatoxylon).	Internally in diarrhea, dysentery, leucorrhœa, etc. Externally to sluggish ulcers, etc.				{ (extr.) 10-30
Lovage.....	See LEVISTICUM.				
Lupulin.....	As a sedative in hysteria, insomnia, and other nervous manifestations.				2-5
Magnesium Benzoate.	Gout, calculi of the bladder, etc....				2½-15
Magnesium Bromid.	As a nerve sedative.....				10-20
Magnesium Carbonate.	Acidity of the stomach, sick headache, etc.				30-60
Magnesium Citrate, Effervescent.	As SOLUTION OF MAGNESIUM CITRATE.			1-3	
Magnesium Lactate.	Mild laxative.....				15-45
Magnesium Oxid (Magnesia).	Dyspepsia, constipation, gastric acidity, and as an antidote in arsenic poisoning.				15-60
Magnesium Sulfate (Epsom Salt).	As an active purgative in dropsy, etc.			4	
Magnesium Sulfate, Effervescent.	As MAGNESIUM SULFATE (more agreeable).			4-8	
Magnolia Bark....	Malarial fever, rheumatism, etc.; as a tonic bitter.	{ (tinct.) 1		½-1	
Manganese Carbonate.	Anemic conditions.....				10-30
Manganese Dioxid, Precipitated.	Anemia, scurvy, syphilis, amenorrhea, etc. In ointment, for parasitic skin-diseases.				3-10
Manganese Hypophosphite.	As CALCIUM HYPOPHOSPHITE.....				10-30
Manganese Iodid.	Anemia due to syphilis, cancer, tuberculosis, etc.				2
Manganese Phosphate.	Chlorosis, etc.....				1-5
Manganese Sulfate.	Malarial jaundice, etc.....				1-3
Manna.....	As a laxative, usually combined with other drugs.			8-16	
Marrubium.....	See HOARHOUND.				
Mass. Blue.....	Biliary stimulant and purgative....				3-5
" of Copaiba.....	A COPAIBA.....				10-30
" o Ferrous Carbonate.	Anemia, Chlorosis, etc.....				3-6

DRUG	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Mastic.....	Locally, in alcoholic solution, as a styptic to insect bites, small wounds, etc. Rarely internally.				
Matico.....	Bronchitis, diarrhea, hemorrhages from the lungs, kidneys, stomach, and intestines, etc.			1-2	
May-Apple.....	See PODOPHYLLUM.				
Melissa.....	As an adjuvant to other drugs in febrile diseases.	{ (infus.) 16-32			
Menthol.....	Internally for pain in the stomach. Locally for headache, neuralgia, toothache, etc. In solution, as a spray in coryza, hay-fever, etc.				1-2
Menyanthes.....	See BUCK-BEAN.				
Mercury Acetate.....	Syphilis.....				1-1
" Ammoniated.	Externally, as ointment, in chronic skin diseases.				
Mercury Benzoate.	In solution for injection in syphilis, etc.				
" Bichlorid.	Internally in syphilis, anemia, etc. Externally, in solution, as a germicide.				10-15
" with Chalk.	Constipation, fermentative diarrhea etc.				1-1
" Gallate....	Syphilis.....				1-1
" Mild Chlorid of (Calomel).	Dysentery, biliousness, torpid liver, etc.				{ 1-1 caoh. 5-15 10-1
Mercury, Red Iodid of.	Syphilis.....				
Mercury, Red Oxid of.	Locally, as dusting-powder, on gummatous ulcers.				
Mercury Salicylate.	Internally in secondary syphilis. Locally, as ointment, for skin eruptions.				1-1
Mercury Subsulphate.	Croup, etc.....				2-4
Mercury Tannate.	Syphilis.....				1-2
Mercury, Yellow Iodid of.	Syphilis.....				1-2
Mercury, Yellow Oxid of.	Locally, in ointment, for conjunctivitis, blepharitis, etc.				
Methyl Iodid.....	Locally to produce blistering.				
Salicylate.	As OIL OF WINTERGREEN.				
Methylene Bichlorid.	General anesthetic.				
Methylene Blue....	Intermittent fevers, gonorrhea, etc.				1-3
Methysticum.....	See KAVA.				
Mezereum.....	Locally, as ointment, to maintain discharge from suppurating surfaces. Internally in scrofula, syphilis, rheumatism, etc.				10
Milk, Fermented..	Disorders of nutrition, anemia, etc. (One or two bottles a day).....				
Mixture of Castor-Oil.	As OIL, CASTOR-.....	4-16			
Mixture of Chalk..	Fermentative diarrhea.....	1-4			
Mixture of Compound Iron.	Anemia, chlorosis, menstrual disorders, etc.	8-16			
Mixture of Compound Licorice.	Bronchitis, laryngitis, cough, etc....	1-4			
Mixture of Creosote.	To allay vomiting.....	8			
Mixture of Guaiac.	As GUAIAC.....	4-8			
Mixture of Rhubarb and Soda.	For children, in acidity of the stomach, constipation, etc.	1-1			
Mixture of Senna, Compound.	As INFUSION OF SENNA.....	8-12			
Morphin.....	By injection, or by mouth, to produce sleep, allay pain, etc.				1-1
Mountain-Balm...	See YERBA SANTA.				
Muscarin.....	Epilepsy, night-sweat of consumption, etc.				1-15
Musk.....	Nervous irritability, typhoid, feebleness, hiccup, flatulence, etc.	{ (tinct.) 1-1			2-5
Mustard Seed.....	In plaster, poultice, or bath, for counter-irritation and blistering. Internally as a laxative, and as an emetic in narcotic poisoning.			{ lax. 1-2 emet. 2-4	

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Myristica.....	See NUTMEG.				
Myrrh.....	Bronchitis, cystitis, metritis, leucor- rhea, etc. Locally to spongy gums, ulcers, etc.		{ (emuls.) 10-15 (tinct.) 10-30		
Naphthalene...	Intestinal catarrh, diarrhea, bron- chitis, etc. Locally, as ointment, for eczema, etc.				5-10
Nickel Bromid....	As SODIUM BROMID.....				10
Nitric Acid, Dilu- ted.	Gastric and intestinal diarrheas.....		5-30		
Nitroglycerin.....	See SPIRIT OF GLYCERYL TRINITRATE.				
Nitrous Oxid. (Laughing-Gas).	By inhalation as an anesthetic in minor operations.				
Nutmeg.....	In gastric debility, and as a heart sedative, etc.				5-10
Nux Vomica.....	As a stimulant to respiration, and as a tonic to the alimentary canal.		{ (tinct.) 5-20		{ (extr.) 8-1
Oak, White.....	See QUERCUS.				
Oil of Almond, Expressed.	In emulsion as a demulcent.....	1-8			
Oil of Amber.....	Locally, diluted with olive-oil, as a counter-irritant. Internally in spasmodic croup, hysteria, ner- vous disorders, etc.		2-6		
" of Anise.....	Flatulent colic, griping, etc.....		1-5		
" of Bay.....	As a perfume.				
" of Bayberry (Laurel-Oil).	Locally in rheumatism, sprains, pain- ful swellings, etc.				
Oil of Betula.....	As OIL OF WINTERGREEN.				
" of Bitter Al- mond.	As HYDROCYANIC ACID.....		1-1		
Oil of Cade.....	Locally, in ointment or soap, for chronic skin-diseases.				
" of Cajuput....	Locally in ringworm, acne, tooth- ache, and to kill crab-lice. Inter- nally in flatulent dyspepsia, blad- der catarrh, bronchitis, etc.		5-20		
" of Calamus...	See CALAMUS.				
" of Caraway...	Flatulent colic, etc.....		1-10		
" Castor.....	Irritative diarrhea, constipation of children, and constipation after acute diseases.	{ ch. 1-2 ad. 4-8			
" of Chamomile.	To allay spasms, expel wind from the stomach, etc.		1-5		
" of Chenopodi- um.	To expel roundworms in children....		10		
Oil of Cinnamon..	Uterine hemorrhage, flatulence, etc. Mainly as an addition to other drugs.		1-3		
" of Cloves.....	Locally to kill crab-lice, and as a counter-irritant and anesthetic Internally to expel flatus, allay cough, etc.		2-5		
" Cod-Liver.....	Impaired nutrition, rickets, anemia, tuberculosis, rheumatism, scrof- ula, etc.	1-4			
" of Copaiba....	As COPAIBA.....		5-10		
" of Coriander...	Flatulence, neuralgia, muscular rheu- matism, etc.		1-5		
" Croton.....	Locally as an irritant. Internally to produce purging.		1-2		
" of Cubeb.....	As CUBEBS.....		10-15		
" of Dill.....	Flatulence.....		2-10		
" of Erigeron....	Uterine hemorrhage, intestinal hem- orrhage in enteric fever, dysen- tery, gonorrhea, etc.		10-30		
" of Eucalyptus.	As EUCALYPTUS.....		1-5		
" of Fennel.....	In flatulence, and to prevent griping when purges are given.		5-15		
" of Flaxseed....	Used in LINIMENT OF LIME.				
" of Hyoscyamus, Compound.	Locally, on cotton, to allay pain in earache.				
Oil of Juniper.....	Flatulence, dropsy in chronic kidney catarrh, etc. Usually given as gin.		5-10		

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Oil of Lavender Flowers.....	Externally and internally for nervous headache.	.....	1-5		
Oil of Lemon.....	Chiefly as a flavoring agent.				
" Linseed.....	See OIL OF FLAXSEED.				
" of Mustard, Volatile.	Locally as a counter-irritant.				
Oil of Myrcia.....	See OIL OF BAY.				
" Neat's-Foot....	As a substitute for cod-liver oil, but less agreeable.	1-2			
" of Nutmeg.....	As NUTMEG.....	.....	1-3		
" of Nutmeg, Expressed.	As an embrocation in chronic rheumatism.				
Oil, Olive.....	Externally to burns and skin irritations. Internally in constipation, gall-stones, etc., and as a food. In the presence of gall-stones half a pint to a pint should be given.		<i>lax.</i> 8-16		
" of Pennyroyal.	Emmenagogue, stimulant, and carminative.	.....	2-10		
" of Peppermint	Flatulent colic, nausea, vomiting etc. Locally in neuralgia, etc.	.....	2-5		
" Phosphorated.	As PHOSPHORUS.....	.....	1-5		
" of Pimenta.....	As a stimulant and to expel flatus.	.....	3-5		
" of Pine.....	By inhalation in bronchitis, etc.				
" of Rose.....	To perfume lotions, ointments, etc.				
" of Rosemary....	Internally in flatulence, colic, retarded menstruation, nervous depression, etc. Locally for sprains, etc.	.....	1-3		
" of Santal.....	Gonorrhea, bronchitis, asthma, etc.	.....	5-20		
" of Savin.....	Leucorrhea, menorrhagia, uterine disorders generally.	.....	2-10		
" of Sesame.....	Sometimes as a food in wasting diseases.	4-8			
" of Spearmint....	As OIL OF PEPPERMINT.....	.....	2-5		
" of Tar.....	Locally, as ointment, or diluted, for scaly skin-diseases. See also TAR.				
" of Thyme.....	Externally, in baths lotions, etc., for rheumatic pains and to cure the itch, indolent ulcers, etc. Internally as a stimulant to digestion.	.....	2-6		
" of Turpentine.	Internally in exhausting fevers, intestinal ulcers, typhoid, hemorrhages, cystitis, urethritis, etc. Externally, diluted, as a counter-irritant in lumbago, rheumatism, bronchitis, etc.		<i>(emuls.)</i> 1-4	5-20	
" of Wintergreen	Locally, in liniments, for sciatica, lumbago, etc. Internally as SALICYLIC ACID.	.....	5-10		

OINTMENT	USES
Ointment of Ammoniated Mercury...	Sluggish skin-affections, eczema, ringworm, syphilitic eruptions.
" of Belladonna.....	To allay pain.
" Blue.....	As OINTMENT, MERCURIAL.
" of Boric Acid.....	Burns, abrasions, inflamed eyelids, etc.
" of Carbolic Acid.....	Burns, superficial wounds, etc.
" Chrysarobin.....	Psoriasis and other chronic skin-diseases.
" Diachylon.....	Eczema, fetid sweating, etc.
" Iodin.....	Swelling of glandular tissue, chilblains, etc.
" Iodoform.....	As IODOFORM.
" Mercurial.....	By embrocation in syphilis, and to reduce inflamed swellings.
" of Mercuric Nitrate.....	Chronic and parasitic skin-diseases, syphilitic ulcers, fissures of the anus or of the lips, etc.
" Nutgall.....	As OINTMENT OF TANNIC ACID.
" of Potassium Iodid.....	As OINTMENT, IODIN.
" of Red Mercuric Oxid.....	Sluggish and syphilitic ulcers, etc.
" of Rose-Water (Cold-Cream).	Chapped hands, abrasions, superficial lesions, etc.
" Stramonium.....	To allay pain in hemorrhoids, rectal cancer, ulcers, etc.
" Sulfur.....	The itch.
" of Tannic Acid.....	Hemorrhoids, prolapse of the rectum, sluggish ulcers, etc.
" Tar.....	Scaly skin eruptions, eczema, ringworm, etc.
" Veratrin.....	As VERATRIN.
" of Yellow Mercuric Oxid.....	Blepharitis, conjunctivitis, etc.
" of Zinc Oxid.....	Superficial burns, fissures of anus and nipples, local eruptions, etc.

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Oleoresin of Capsicum.	Locally, as plaster or liniment, to produce counter-irritation. Internally in flatulence, etc.	.....	1-1		
Oleoresin of Cubebs.	Gonorrhea, bronchitis, etc.	.....	2-20		
Oleoresin of Ginger.	As GINGER.	.....	1-1		
Oleoresin of Lupulin.	As HOPS.	.....			10-20
Oleoresin of Male Fern.	To expel tapeworms.	1-2			
Oleoresin of Pepper.	As a stimulant to mucous membranes. See PEPPER.	.....	1-1		
Ononin.	Dropsy, chronic rheumatism, etc.	.....			3-5
Opium.	Watery and serous diarrheas, diabetes, insomnia due to pain, restlessness, certain valvular heart-diseases, etc.	.....			1-1
Oxygen.	By inhalation in respiratory distress.				
Oxymel (Honey and Vinegar).	As a gargle in sore throat.				
Pancreatic Solution.	As PANCREATIN.	1-4			
Pancreatin.	As a digestant for children and adults usually added to the food; also given in nutrient enemas.				
Papaw.	Indigestion.				1-10
Paraffin, Soft.	As a bland dressing for burns, etc., and as a base for other ointments.				
Paraldehyde.	To produce sleep in insomnia not due to pain.	1-2			
Paregoric.	See TINCTURE OF OPIUM, CAMPHORATED.				
Pareira.	A diuretic in cystitis, urethritis, etc.	{ (fl. extr.) 1			
Pelletierin Sulfate.	As POMEGRANATE.				5-10
Tannate.	To expel tapeworms (not in children)				3-8
Pennyroyal.	Colic, flatulence, gastric catarrh, etc.	(infus.) 16-32			
Pepper, Black.	Flatulence, relaxation of mucous membranes of stomach and intestines, malaria, etc.				5-20
Peppermint.	See OIL OF PEPPERMINT.				
Water.	Colic, headache, hiccup.	1-1			
Pepsin.	Indigestion (usually given in combination with hydrochloric acid).				5-30
Petrolatum.	As a bland dressing and as a base for active ointments.				
Petroleum Benzin.	Parasitic skin-diseases (by local application).				
Phenol (Carbolic Acid).	Generally as an antiseptic. Locally, in solution or ointment, as dressing for sluggish ulcers, etc. Internally in obstinate vomiting, fermentative diarrhea, etc.				1-2
Phenyl Salicylate.	Intestinal catarrhs and fermentation, cholera, dysentery, etc.; also muscular and articular rheumatism, etc.				15-45
Phosphoric Acid, Diluted.	Hysteria, diabetes, jaundice, etc.		20-60		
Phosphorus.	Nervous exhaustion, sexual impotence, rickets, etc.				100
Physostigmin.	In solution, by instillation, to contract the pupil of the eye. Hypodermically as a prophylactic after ether anesthesia.				{ hyp. 1-1
Physostigma (Calabar Bean).	As an addition to laxative drugs; in bronchitis as an expectorant, etc.		{ (tinct.) 5-20		{ (extr.) 1
Phytolacca.	Externally, as ointment, and internally, as tincture, in ringworm, favus, scabies, etc.	{ (tinct.) 1			
Pilocarpin Hydrochlorid.	As PILOCARPUS, and hypodermically to remove opacities in the vitreous humor of the eye, etc.				{ 1-1 hyp. 1-1
Pilocarpus (Jaborandi).	Uremia, dropsy of the heart or kidneys, etc.	{ (tinct.) 2-4	{ (fl. extr.) 10-30		

PILLS (Only those official in the U. S. Pharmacopoeia have been included)	USES	DOSE (Number)
Pills of Aloes.....	Constipation.....	1-3
" of Aloes and Iron.....	Amenorrhea due to anemia when accompanied with constipation.....	1-3
" of Aloes and Mastic.....	Constipation.....	1-3
" of Aloes and Myrrh.....	Constipation with flatulence, uterine catarrh, amenorrhea.....	3-6
" of Asafetida.....	As ASAFETIDA.....	1-3
" Bland's.....	Anemia, chlorosis, etc.....	1-6 lax.
" Compound Cathartic.....	Constipation, torpid liver, etc.....	1 cath.
" of Iron Iodid.....	As SIRUP OF IRON IODID.....	3
" of Opium.....	As OPIUM.....	2-10
" Phosphorus.....	As PHOSPHORUS.....	1-2
" of Podophyllum, Belladonna, and Capsicum.....	Constipation with torpid liver and relaxation of stomach and intestines.....	1-2
" of Rhubarb, Compound.....	Chronic constipation with flatulence.....	1-3
" Vegetable Cathartic.....	As PILLS, COMPOUND CATHARTIC.....	1-4 lax. 1 cath. 3

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Pimenta.....	See ALLSPICE.				
Piperazin.....	For prevention of calculi, and to relieve irritation due to acid urine.				5-10
Piperin.....	Intermittent fevers.....				3-6
Piscidia.....	To relieve pain in neuralgia, toothache, headache, insomnia, etc.	{ (fl extr.) 1-2			

PLASTERS	USES
Plaster of Ammoniac with Mercury..	Enlarged glands, syphilitic swellings, etc.
" of Belladonna.....	Rheumatism, neuralgic pains, palpitation of the heart, etc.
" of Capsicum.....	Neuralgia, muscular rheumatism, etc.
" of Compound Lead.....	Enlarged glands due to scrofula, etc.
" of Lead.....	As a protective covering and to scatter swellings.
" of Menthol.....	Migraine, neuralgic pains, etc.
" of Mercury.....	External syphilitic lesions, etc.
" of Opium.....	To relieve pain.
" of Pitch.....	To produce mild counter-irritation.
" of Soap.....	To disperse tumors, etc.
" of White Lead.....	Superficial burns, local inflammations, etc.

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Podophyllin.....	As PODOPHYLLUM.....				{ lax. 10-15 purg.
Podophyllum (May-Apple).	As a laxative and purgative.....				{ lax. 5-10 purg. 10-20
Pomegranate.....	To expel tapeworms (one pint of decoction is given in hourly doses of one ounce each).				
Porcelain-Clay....	See KAOLIN.				
Potassium Acetate	Acute rheumatism, acid urine, renal and cardiac dropsy, torpid liver, etc.			{ purg. 4-8	{ diarr. 10-30

Drug	Uses	Doses			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Potassium Bicarbonate.	Catarrhal jaundice, hyperacidity of the stomach, acid urine, etc.	.....	.....	.....	5-40
Potassium Bitartrate.	As a diuretic.....	.....	.....	$\frac{1}{2}$ -2	.....
Potassium Bromid	Epilepsy, nervous excitation, infantile convulsions, certain neuralgias, reflex vomiting, etc.	.....	.....	.....	$\left\{ \begin{array}{l} \text{ch.} \\ 2-20 \\ \text{ad.} \\ 5-60 \\ 10-30 \end{array} \right.$
Potassium Carbonate.	As POTASSIUM BICARBONATE, but rarely employed.	.....	.....	.....	.....
Potassium Cantharidate.	Occasionally for subcutaneous injection in tuberculosis.	.....	.....	.....	.....
Potassium Chlorate.	Chiefly as a gargle in about 2-10 grains to the ounce of water.	.....	.....	.....	.....
Potassium Citrate.	To induce perspiration, and as a diuretic.	.....	.....	.....	5-30
Potassium Citrate, Effervescent.	As POTASSIUM CITRATE (a more pleasant preparation).	.....	.....	1-2	.....
Potassium Cyanide.	As HYDROCYANIC ACID.....	.....	.....	.....	$\frac{1}{2}$ -1
Potassium Dichromate.	In weak solution as an astringent in ulcerative tonsillitis.	.....	.....	.....	.....
Potassium Hypophosphite.	As CALCIUM HYPOPHOSPHITE.	.....	.....	.....	.....
Potassium Iodid..	Syphilis, rheumatism, chronic metallic poisoning, asthma, emphysema of the lungs, etc.	.....	.....	.....	5-20
Potassium Nitrate	To produce perspiration and increase urination	.....	.....	.....	5-30
Potassium Permanganate.	Locally, in solution, as an application to gangrenous ulcers, cancer, abscesses, fetid nose, etc. Internally as an antidote in poisoning by phosphorus, morphin, etc. Also in dyspepsia and flatulence, and as an emmenagogue.	.....	.....	.....	1-2
Potassium and Sodium Tartrate.	See ROCHELLE SALT.	.....	.....	.....	.....
Potassium Sulfate.	As an aperient and purgative.....	.....	.....	$\left\{ \begin{array}{l} \text{ap.} \\ \frac{1}{2}-2 \\ \text{purg.} \\ 2-4 \\ \text{diur.} \\ \frac{1}{2}-1 \\ \text{purg.} \\ 4-8 \end{array} \right.$	.....
Potassium Tartrate.	Mild diuretic and purgative.....	.....	.....	.....	.....
Potassium Tellurate.	To arrest night-sweat of pulmonary tuberculosis.	.....	.....	.....	1-2
Powder, Aromatic	Flatulence, diarrhea, colic. Externally, in poultice, to allay nausea and colic.	.....	.....	.....	5-15
Powder, Compound Acetanilid.	As ACETANILID.....	.....	.....	.....	2-10
Powder, Compound Chalk.	For the preparation of CHALK MIXTURE.	.....	.....	.....	20-60
Powder, Compound Effervescent (Seidlitz Powder).	Dissolve white and blue powders in separate glasses, mix, and drink during effervescence (one set is laxative, two purgative).	.....	.....	.....	.....
Powder, Compound, of Jalap.	To produce watery evacuations in dropsy, etc.	.....	.....	.....	10-40
Powder, Compound, of Licorice.	As a mild laxative.....	.....	.....	$\frac{1}{2}$ -2	.....
Powder, Compound, of Morphin.	As a substitute for POWDER OF IPECAC AND OPIUM.	.....	.....	.....	5-10
Powder, Compound, of Rhubarb.	As a laxative in acid dyspepsia, diarrhea, etc., especially in children.	.....	.....	.....	10-60
Powder of Ipecac and Opium.	To allay pain and produce perspiration in early stages of coryza, laryngitis, bronchitis, pneumonia, etc. Also to check diarrhea, dysentery, etc.	.....	.....	.....	3-5
Prickly Ash.....	See XANTHOXYLUM.	.....	.....	.....	.....
Prune.....	As an article of diet, and as a mild laxative in habitual constipation.	.....	.....	.....	.....
Prunus Virginiana (Wild Cherry Bark).	As a tonic in general debility and relaxation of the mucous membrane of the stomach. Also as a sedative in bronchitis, laryngitis, etc.	$\left\{ \begin{array}{l} \text{(sirup)} \\ 1-4 \end{array} \right.$	$\left\{ \begin{array}{l} \text{(fl. extr.)} \\ 30-60 \end{array} \right.$	.....	.....

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Pulsatilla (Anemone).	Cataract, rheumatism, paralysis, melancholia, syphilis, etc.	.....	.....	.....	{ (pwd.) 2-5 (extr.) 1-3 (resin) 15
Pumpkin Seed (Pepo).	To expel tapeworms (usually in emulsion containing 1-2 ounces of bruised seeds).	.....	.....	.....
Pyridin	By inhalation as an antispasmodic in bronchial asthma.	.....	5-10	.....
Pyrogallol	Locally, in solution or ointment, in parasitic skin-diseases, lupus, leprosy, etc.	.....	.....	.....
Quassia	As a tonic and stimulant bitter in dyspepsia, loss of appetite; and, in enemas, for the expulsion of thread- and pinworms.	{ (tinct.) 1-1	{ (fl. extr.) 10-30	.....	{ (pwd.) 5-30 (extr.) 1-3
Queen's Root	See STILLINGIA.	.....	.....	.....
Quercus (White Oak).	In infusions, for vaginal irrigations in leucorrhœa, vaginitis, etc., and for rectal injections in hemorrhoids, prolapse of the rectum, etc. Also as a gargle in tonsillitis, pharyngitis, etc.	.....	.....	.....
Quillaja	The powder is used as a snuff in chronic rhinitis, and an infusion is employed to cleanse the scalp when affected with ulcers, etc. For other uses see under FLUID EXTRACTS and TINCTURES.	.....	.....	.....
Quinidin Sulfate ..	As QUININ .....	.....	.....	.....	10-60 10mc
Quinin	Malaria, bilious remittent fever, neuralgia due to malarial infection, and as a tonic during convalescence after acute infectious diseases, etc. The sulfate is usually employed.	.....	.....	.....	{ 1-3 antisep. 5-30
Quinin Salicylate.	As other salts of quinin, and in rheumatism and gout.	.....	.....	.....	{ anti- rheum. 2-10 2-5
Quinin Tannate ..	Being less bitter than other quinin salts, it is usually given to children, either in sirup or in chocolate lozenges.	.....	.....	.....
Quinin Valerate ..	As QUININ .....	.....	.....	.....	1-5
Ratany	See KRAMERIA.	.....	.....	.....
Resin of Jalap.	Like JALAP, as a purgative .....	.....	.....	.....	1-3 lax.
Resin of Podophyl- lum.	As a laxative and purgative .....	.....	.....	.....	{ 10-70 purg. 1-1
Resin of Scammony.	As a purgative. See SCAMMONY .....	.....	.....	.....	5-15
Resorcin	Internally as an intestinal antiseptic and febrifuge. Externally, in solution, as an application to eczema, ringworm, the itch, syphilitic ulcers, etc.	.....	.....	.....	2-5
Rhamnus Purshiana.	See CASCARA SAGRADA.	.....	.....	.....
Rheumatism Root.	See DIOSCOREA.	.....	.....	.....
Rhubarb (Rheum).	As a tonic in dyspepsia and intestinal catarrhs when constipation is present. As a laxative in summer diarrheas of children; also as a purgative.	{ ch. 1-2 of sirup	.....	.....	{ 5-10 purg. 10-40
Rhus Glabra	See SUMACH.	.....	.....	.....
Rochelle Salt	Saline laxative .....	.....	.....	2-4	
Rosemary	See OIL OF ROSEMARY.	.....	.....	.....
Rubus	See BLACKBERRY.	.....	.....	.....
Rue	Uterine stimulant, and to expel flatus.	.....	{ (oil) 3-0	.....	15-30
Sabadilla	In ointment or decoction to destroy lice, itch-mites, etc.	.....	.....	.....
Sabal (Saw-Palmetto).	Inflammations of the genito-urinary tract, chronic bronchitis, tuberculosis, etc.	{ (fl. extr.) 1-2	.....	.....

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Saffron.....	Flatulent dyspepsia, etc.....				5-30
Sage (Salvia).....	A domestic remedy in dyspepsia, febrile diseases, etc.	{ (infus.)			20-30
Salep.....	Made into a mucilage and used as a food and demulcent.	{ 8-16			ad lib.
Salicin.....	Gastric fermentation, indigestion, loss of appetite; sometimes in rheumatic affections.				5-30
Salicylic Acid.....	Rheumatic fever, sciatica, lumbago etc.				5-20
Salol.....	See PHENYL SALICYLATE.				
Salt, Common.....	See SODIUM CHLORID.				
Sambucus.....	See ELDER FLOWERS.				
Sanquinaria.....	See BLOODROOT.				
Santonin.....	Incontinence of urine, roundworms, etc.				{ worm. 1-2 ch. 1-1
Sarsaparilla.....	Gout, rheumatism, syphilis, sluggish skin-diseases, etc. See also under SIRUPS.	{ (fl. extr.) 1-1			
Sassafras.....	Chiefly as a flavoring agent; sometimes, in infusion, as a domestic remedy in fevers.				
Savin.....	Amenorrhea, painful menstruation, etc. The moistened powder is sometimes applied locally to warts, indolent ulcers, etc.		{ (oil) 2-5		5-10
Scammony.....	Drastic purgative.....				5-15
Scoparius.....	As a diuretic in dropsy.....	{ (decoct.) 8	{ (fl. extr.) 15-30		
Scopola.....	Insomnia due to nervous excitation..		{ (fl. extr.) 1-3		{ 1-3 (extr.) 1-1
Scopolamin Hy- drobromid.....	Acute manias, nervous excitation, nocturnal enuresis, etc.				150-180
Scutellaria.....	Epilepsy, St. Vitus's dance, enuresis, etc.			1-2	
Seidlitz Powder...	See POWDER, COMPOUND EFFERVESCENT.				
Senega.....	Bronchitis, croup, etc.....	{ (sirup) 1-2	{ (fl. extr.) 10-20		10-20
Senna.....	Cathartic.....		{ (fl. extr.) 1-2		
Serpentaria.....	As a mild diuretic and febrifuge, and to promote eruption of rash in certain febrile diseases.	{ (tinct.) 1-2	{ (fl. extr.) 10-30		10-30
Seven-Barks.....	See HYDRANGEA.				
Silver Nitrate....	Chronic gastric and intestinal diarrheas, gastric and intestinal ulcers, etc.				1-1
Sirup of Almond..	Demulcent and mild sedative.....	1-2			
" of Althaea....	Sore throat.....	1-4			
" of Blackberry Bark.	As a mild astringent in serous diarrheas.	1-2			
Sirup of Calcium Lactophosphate.	Scrofula rickets, etc.....	1-4			
Sirup of Ginger....	As an ingredient in purgative mixtures and for the relief of flatulence.	1-4			
" of Gum-Arabic.	Mild inflammations of larynx and throat.				
Sirup of Hydriodic Acid.	Scrofula in children, inflammation of the kidneys, etc.	1-2			
Sirup of Hypophosphites.	As a tonic in debilitated states, such as anemia, scrofula, tuberculosis, rickets, etc.	1-4			
Sirup of Iodid of Iron.	Anemia, scrofula, eczema, gonorrheal arthritis, etc.		20-120		
Sirup of Ipecac...	As IPECAC.....	{ emet. ch. 1-1 ad. 4-8 ad. 4	{ expect. ch. 2-10 ad. 20-60 ch. 30-60 20-60		
" of Krameria.	Diarrhea.....				
" of Lime.....	As LIME-WATER.....				
" of Rhubarb.	As a cathartic to children.....	1			
" of Rhubarb, Aromatic.	In diarrhea and constipation of infants and children.	1-2			
Sirup of Sarsaparilla, Compound.	Chiefly as a vehicle for potassium iodid.	1-4			
Sirup of Senega...	Bronchitis.....	1-2			
" of Senna.....	Cathartic for children.....	1-2			

DRUG	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Sirup of Squill.....	As an ingredient in cough-mixtures.	$\frac{1}{2}$ -1			
" of Squill, Compound.	Croup, bronchitis, etc. Also as an emetic and purgative.	$\left\{ \begin{array}{l} ad. \\ 20-30 \end{array} \right.$	$\left\{ \begin{array}{l} croup \\ 10-30 \end{array} \right.$		
Sirup of Tar.....	As TAR.....	1-4			
" of Tolu.....	As an addition to cough-mixtures.	1-4			
" of Wild Cherry.	As an ingredient in cough-mixtures.	1-4			
Slippery Elm.....	In lozenges to allay cough and irritation of throat, bronchi, etc. Also, as a mucilage, in diarrhea, dysentery, etc.	$\left\{ \begin{array}{l} (mucil.) \\ 4-16 \end{array} \right.$			
Snakeroot.....	See SERPENTARIA.				
Sodium Acetate...	Diuretic and laxative.....			$\left\{ \begin{array}{l} lax. \\ 1-2 \end{array} \right.$	$\left\{ \begin{array}{l} diur. \\ 10-30 \end{array} \right.$
" Arsenate...	As SOLUTION OF SODIUM ARSENATE				
" Benzoate...	Acute articular rheumatism, gout, etc.				10-40
" Bicarbonate.	Heartburn, nausea, headache due to indigestion, etc.				10-40
Sodium Borate (Borax).	In solution as a mouthwash and gargle in affections of mouth and throat. Locally in certain skin eruptions. Also in vaginal douches, instillations into the eye, etc.				
Sodium Bromid...	As POTASSIUM BROMID.....				10-60
" Carbonate	Internally as SODIUM BICARBONATE. Locally, in solution, as application to dry skin-eruptions.				10-30
" Chlorate...	As POTASSIUM CHLORATE.....				5-20
" Chlorid... (Common Salt).	In normal solution for injection into veins in surgical shock, great loss of blood, etc. In enemas for removal of hard masses of feces, and to expel roundworms and threadworms. In weak solutions for nasal and vaginal douches, etc. Internally to control gastric hemorrhage, etc.			1	
Sodium Citrate...	Diuretic and laxative.....			$\left\{ \begin{array}{l} lax. \\ 6-10 \end{array} \right.$	$\left\{ \begin{array}{l} diur. \\ 10-40 \end{array} \right.$
" Hydroxid...	As POTASSIUM HYDROXID.				10-30
" Hypophosphite.	Rachitis, dental caries, scrofula, tuberculosis, etc.				10-40
Sodium Iodid.....	As POTASSIUM IODID.....			$\left\{ \begin{array}{l} lax. \\ \frac{1}{2}-2 \\ purg. \\ 1-2 \end{array} \right.$	
" Phosphate	Laxative and purgative, especially in catarrhal jaundice and torpid liver.			$\left\{ \begin{array}{l} 1-2 \\ 1-4 \end{array} \right.$	
Sodium Phosphate. Effervescent.	Laxative.....				
Sodium Salicylate.	As SALICYLIC ACID.....				5-30
" Sulfate.....	To produce watery stools in torpid liver, intestinal indigestion, etc.			4-8	
" Sulfite.....	Internally in fermentative indigestion, acid vomiting, etc. Locally, in solution, to ulcerous sore mouth, the itch, tonsillar ulcers, etc.				20-60
" Valerianate.	As AMMONIUM VALERIANATE.....				5-20
Solanin.....	Reflex vomiting, spasmodic asthma, neuralgia, sciatica, etc.				$\frac{1}{2}$ -1
Solution of Ammonium Acetate.	Acute tonsillitis, bronchitis, eruptive febrile diseases, menstrual disorders, alcoholic intoxication, etc.	4-8			
Solution of Ammonium Citrate.	As SOLUTION OF AMMONIUM ACETATE	4-8			
Solution, Antiseptic.	Locally as an antiseptic wash in inflammations of mouth, throat, ear, nose, vagina, etc. Internally in gastric and intestinal fermentation.	$\frac{1}{2}$ -2			
Solution of Arsenous Acid.	As ARSENIC TRIOXID.....		2-5		
Solution of Arsenous and Mercuric Iodid.	Chronic skin-affections, syphilis, leprosy, psoriasis, etc.		1-5		
Solution of Atropin Sulfate.	As ATROPIN.....		1-2		
Solution of Bismuth and Ammonium Citrate.	Diarrhea due to relaxation of mucous membranes of bowels.	$\frac{1}{2}$ -1			
Solution of Calcium Hydroxid (Lime-Water).	Nausea, vomiting, gastric irritability, acidity, etc. By injection in leucorrhea and metritis.	4-32			

DRUG	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Solution of Chlorin, Compound.	Locally to sloughing ulcers, suppurating wounds, etc. Internally in typhoid, typhus, intestinal fermentation.	1-1			
Solution of Chlorinated Lime.	Locally in skin affections. Internally as an antidote for hydrocyanic acid.	1-1			
Solution of Chlorinated Soda.	Externally to ulcers. Internally as an intestinal antiseptic.	.....	30-40		
Solution of Coal-Tar.	Externally in chronic skin-diseases.				
Solution of Corrosive Sublimate.	As MERCURY CHLORID.....	1-2			
Solution of Ethyl Nitrite.	As SWEET SPIRIT OF NITER.....	.....	20-60		
Solution of Formaldehyde.	As a disinfectant of rooms, etc., by vaporization.				
Solution of India Rubber.	As a protective covering to abrasions, cuts, superficial inflammations, etc.				
Solution of Iodin, Compound.	Constitutional syphilis, etc.....		5		
Solution of Iron Acetate.	Locally and internally to check bleeding.	.....	5-10		
Solution of Iron and Ammonium Acetate.	Chronic catarrh of the kidneys, albuminuria, anemia of Bright's disease, etc.	2-8			
Solution of Iron Chlorid.	As a local and internal hemostatic; diluted (1:32) in the treatment of hemorrhage following childbirth.	.....	2-10		
Solution of Iron Nitrate.	Diarrhea, dysentery, leucorrhea, mucous colic, etc.	.....	5-10		
Solution of Iron Persulfate.	Locally to control bleeding from the nose, mouth, wounds, etc. Also internally as a hemostatic.	.....	5-10		
Solution of Iron Sulfate.	As SOLUTION OF IRON PERSULFATE, but less safe.				
Solution of Lead Subacetate.	Locally, diluted, for sprains and bruises.				
Solution of Magnesium Carbonate.	To overcome gastric acidity and produce catharsis.	8-16			
Solution of Magnesium Citrate.	Mild cathartic.....	32-64			
Solution of Mercury Nitrate.	Locally as a caustic to chancres, cancers, boils, etc.				
Solution of Morphine.	As MORPHIN.....	.....	15-30		
Solution of Pancreas.	See PANCREATIN.				
Solution of Potassium Arsenite.	As ARSENIC TRIOXID.....	.....	1-5		
Solution of Potassium Citrate.	To produce perspiration in febrile affections.	4-8			
Solution of Potassium Permanganate.	Locally for gangrenous ulcers, cancer, abscesses, ozena, sore throat, etc.; and as a general disinfectant.				
Solution of Sodium Arsenate.	As ARSENIC TRIOXID.....	.....	2-5		
Solution of Sodium Ethylate.	Externally as a caustic.				
Solution of Sodium Hydroxid.	Hyperacidity of the stomach.....	.....	10-30		
Solution of Strychnin Hydrochlorid.	As NUX VOMICA.....	.....	2-8		
Spanish Fly.....	See CANTHARIDES.				
Sparteine.....	As SCOPARIUS.....	.....		
Spearmint.....	As OIL OF PEPPERMINT.....	.....		
" Water..	Infantile colic, flatulence.....	1-4			
Spigelia.....	To expel intestinal worms.....	.....	10-30		
Spirit of Ammonia.	As a stimulant and antispasmodic.	1-1			
" of Ammonia, Aromatic.	As SPIRIT OF AMMONIA.....	.....		
Spirit of Anise.....	In flatulence and spasmodic affections.	1-2			
" of Camphor.	Locally for sprains, bruises, headache, etc. Internally as an antispasmodic and sedative.	.....	5-30		
Spirit of Chloroform.....	Colic, painful abdominal affections, etc.	.....	20-60		

DRUG	Uses	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Spirit of Cinnamon of Ether, Compound.	Indigestion, intestinal colic, etc. Palpitation of the heart, nausea, flat- ulence, hiccup, angina pectoris, etc.	..... 1-2	10-20		
Spirit of Glyceryl Trinitrate.	A one-per-cent. alcoholic solution of nitroglycerin, used in angina pec- toris and in all conditions where AMYL NITRITE is used.	.....	1-2		
Spirit of Juniper. . .	In addition to diuretic remedies in the treatment of dropsy.	.....	30-60		
" of Lavender. " of Myrcia (Bay Rum).	Flatulent colic, etc. In toilet preparations, and as a cool- ing application in headache.	1-1			
Spirit of Nitrous Ether (Sweet Spirit of Niter)	As a diuretic, nerve sedative, and to produce perspiration in febrile dis- eases.	.....	20-30 diur. 30-60		
Spirit of Pepper- mint.	As PEPPERMINT. . . . .	.....	5-30		
Spirit of Spear- mint.	As PEPPERMINT. . . . .	.....	20-40		
Spirit of Winter- green.	Chiefly as an adjuvant to other reme- dies.	.....	10-20		
Squill.	As an expectorant in bronchitis, etc. As a diuretic in renal and cardiac dropsy. See also under SIRUPS.	.....	(fl. extr.) 1-5		1-5
Squill, Vinegar of..	Inflammation and congestion of the kidneys	.....	15		
Star Anise.	See ILICIIUM.				
Stavesacre (Sta- phisagria).	Locally, in ointment or lotion, to de- stroy lice and itch-mites.				
Stillivia (Queen's Root).	Syphilis, scrofula, chronic liver con- ditions, etc.	{ (fl. extr.) 1-1			
Storax (Styrax)..	Internally in catarrhs of mucous membranes. Externally, with olive-oil, for the itch.	.....			10-20
Stramonium.	As an antispasmodic in dysmenor- rhea, whooping-cough, retention of urine, etc. The dried leaves may be smoked in cigarettes.	.....	{ (tinct.) 10-30 (fl. extr.) 1-3		{ (extr.) 1-1
Strontium Bromid	Nerve sedative. . . . .	.....		1-3	
Strontium Iodid..	Rheumatic conditions, syphilis, etc.	.....			5-60
Strontium Salicy- late.	As SALICYLIC ACID. . . . .	.....			5-30
Strophanthus. . . .	As DIGITALIS. . . . .	.....	{ (tinct.) 5-15		{ (pwd.) 1-1 (extr.) 1-1 10-10
Strychnin.	As NUX VOMICA. (The sulfate is commonly used.)				
Sublimite, Corro- sive.	See MERCURY, BICHLORID OF.				
Sugar of Milk. . . .	As a sweetening agent added to in- fants' bottles. In large doses as a diuretic in dropsy, etc.	.....		8-48	
Sulfonal.	Insomnia, mental excitement, deliri- um tremens, etc.	.....			20-40
Sulfur.	As a laxative, principally in consti- pation occurring in the presence of hemorrhoids, anal fissure, etc. Also in chronic bronchitis. Ex- ternally in ointment, in various skin-diseases, specifically the itch.	.....		{ lax. 1-2	
Sulfur Iodid.	As ointment, in chronic skin-diseases, such as leprosy, lupus, etc.	.....		
Sulfurated Lime. .	See LIME.				
Sulfuric Acid, Aro- matic.	Cholera, diarrhea, night-sweat of tu- berculosis.	.....	10-30		
Sumach (Rhus Glabra).	In infusion as a gargle for sore throat.	.....		
Sumbul Root. . . .	Together with iron, arsenic, etc., in nervous exhaustion and female disorders.	.....	{ (fl. extr.) 15-60		{ (extr.) 5-15 (pwd.) 15-60
Suprarenal Glands. Desiccated.	Addison's disease, surgical shock, etc.	.....			3-5
Sweet Spirit of Ni- ter.	See SPIRIT OF NITROUS ETHER.				
Talc (Talcum Powder).	Dusting-powder in prickly heat, etc.	.....		
Tamarind.	Mild laxative. . . . .	.....		1-8	
Tannic Acid. . . .	Hematemesis, serous diarrhea, etc.	.....			3-10

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Tansy.....	To remove lumbricoid worms. Used also in hysterical affections and mild fevers.	.....	{ (oil) 1-3	.....	20-60
Tar (Pix Liquida).	As an expectorant in bronchitis, pulmonary affections, etc. Locally, in ointment, for dry, scaly skin-diseases.	{ (sirup) 1-4	.....	.....	1-3
Taraxacum.....	See DANDELION.	.....	.....	.....	{ expect. 1-3 emet. 1
Tartar Emetic.....	Early stages of bronchitis and pneumonia, localized inflammations, poisoning, etc.	.....	.....	.....
Terebene.....	Like copaiba, as a stimulant to mucous membranes.	.....	5-10	.....
Terpin Hydrate...	Bronchitis, laryngitis, hay fever, etc.	.....	.....	.....	2-5
Thuja (Arbor Vitæ).	Internally in bronchitis, rheumatism, and fevers, and to remove intestinal worms. Locally, in ointment, to remove warts, fungus granulation-tissue, etc.	{ (fl. extr.) 1	.....	.....
Thyme.....	See OIL OF THYME.	.....	.....	.....	1-3
Thymol.....	In mouth-washes, gargles, irrigations, etc.; also in ointment for sluggish skin-diseases. Internally in typhoid, dysentery, hookworm disease, etc.	.....	.....	.....
" Iodid.....	As a mild antiseptic application in affections of the nose, ear, skin, etc.	.....	.....	.....	1
Thyroid Glands, Desiccated.	Myxedema, cretinism, dementia, mania, Basedow's disease, etc.	.....	.....	.....
Tincture of Aconite.	As ACONITE.....	.....	3-10	.....	1-2
Tincture of Aloes	As a laxative. Locally to ulcers, bed-sores, etc.	2	.....	.....
" of Aloes and Myrrh.	Amenorrhea with constipation.....	1-2	.....	.....	10-30
Tincture of Arnica	Externally to sprains, bruises, local pains, etc.	.....	.....	.....
" of Asafetida.	As ASAFETIDA but rarely used on account of its bad taste.	.....	10-30	.....	5-20
Tincture of Belladonna Leaves.	As BELLADONNA..	.....	5-20	.....
Tincture of Ben-zoin.	Chiefly as a lotion to chapped hands, sunburn, etc.	.....	.....	.....	20-60
Tincture of Ben-zoin, Compound.	As an expectorant in bronchitis. Locally applied to ulcers, sore nipples, fissures, etc.	.....	20-60	.....
Tincture of Calen-dula.	As a cooling application in bruises, etc.	.....	.....	.....	1-2
Tincture of Calum-ba.	Bitter tonic and digestant.....	1-2	.....	.....
Tincture of Can-tharides.	Internally as CANTHARIDES.....	.....	1-10	.....	5-30
Tincture of Capsi-cum.	Atonic stomach conditions; otherwise as CAPSICUM. Diluted as a gargle for sore throat.	.....	5-30	.....
Tincture of Carda-mom Compound.	Flatulence, indigestion, etc.....	1-2	.....	.....	5-20
Tincture of Chlorid of Iron.	Locally as a styptic. Internally to arrest hemorrhages; also in chronic inflammations of mucous membranes.	.....	5-20	.....
Tincture of Cimici-fuga.	As CIMICIFUGA.....	1-2	.....	.....	1-2
Tincture of Cin-chona.	Tonic and stimulant to the stomach	1-2	.....	.....
Tincture of Cinnamon.	In flatulence, and as an addition to diarrhea mixtures.	1-2	.....	.....	15-60
Tincture of Colchicum Seed.	As COLCHICUM.....	.....	15-60	.....
Tincture of Digita-lis.	As DIGITALIS.....	.....	10-30	.....	1-2
Tincture of Gambir, Compound.	Serous diarrhea.....	1-2	.....	.....
Tincture of Gelsemium.	As GELSEMIUM.....	.....	5-15	.....	1-2
Tincture of Gentian, Compound.	Bitter tonic and stimulant to the stomach.	1-2	.....	.....
Tincture of Ginger	Abdominal pain, flatulence, etc. ....	.....	20-60	.....	1-2
Tincture of Guaiac	As a gargle in tonsillitis, pharyngitis, etc. Sometimes internally in rheumatism and gout.	1-2	.....	.....

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Tincture of Hydrastis.	As HYDRASTIS.....	1-2			
Tincture of Hyoscyamus.	As HYOSCYAMUS.....		10-30		
Tincture of Indian Cannabis.	As CANNABIS INDICA.....		5-60		
Tincture of Iodin.	Occasionally in obstinate vomiting, otherwise as IODIN.		1-3		
Tincture of Ipecac and Opium.	As Compound POWDERS OF IPECAC AND OPIUM.		5-20		
Tincture of Kino. of Krameria.	As an addition to diarrhea mixtures. Internally for diarrhea. Also as a gargle in sore throat and as injection in gonorrhea.	1-2 1-2			
Tincture of Lavender, Compound	Nausea, flatulence, etc.....		30-60		
Tincture of Lobelia.	Expectorant.....		10-20		
Tincture of Musk.	As MUSK.....	1-2			
Tincture of Myrrh.	As a local application to ulcers, spongy gums, sore throat, etc.				
Tincture of Nux Vomica.	As NUX VOMICA.....		5-20		
Tincture of Opium (Laudanum).	As an addition to pain-allaying lotions, etc.				
Tincture of Opium, Camphorated (Paregoric).	Flatulence, abdominal pain, diarrhea, cough, etc.	1-4			
Tincture of Opium, Deodorized.	As OPIUM.....		5-20		
Tincture of Physostigma.	As PHYSOSTIGMA.....		10-30		
Tincture of Quassia.	As a bitter tonic, and in enemata to destroy thread-worms.		15-60		
Tincture of Rhubarb.	Purgative, stimulant to the stomach	1-1 purg.			
Tincture of Sanguinaria.	As SANGUINARIA.....	4-8 emet.			
Tincture of Serpentaria.	Usually in combination with other tonic remedies.	1-2			
Tincture of Squill	As SQUILL.....		10-30		
Tincture of Stramonium.	As STRAMONIUM.....		5-20		
Tincture of Strophanthus.	As STROPHANTHUS.....		3-15		
Tincture of Valerian.	As VALERIAN, in hysteria, etc., and as a prompt stimulant in febrile disorders.	1-2			
Tincture of Valerian, Ammoniated.	In hysteria (preferable to the simple tincture).		15-60		
Turpentine.....	See OIL OF TURPENTINE.				
Ulmus.....	See SLIPPERY ELM.				
Urotropin.....	See HEXAMETHYLENAMINE.				
Uva-Ursi.....	Inflammations of urinary organs, bronchitis, diarrhea, uterine hemorrhage, etc.				20-60
Valerian.....	Hysteria, nervousness, febrile delirium, etc.				10-30
Vanillin.....	Atonic dyspepsia (rarely used).				1-1
Veratrin.....	Internally for neuralgic pains, palpitation of the heart, acute articular rheumatism, etc. In ointment, locally, over neuralgic nerves and painful areas.				20-25
Viburnum Opulus (Cramp Bark).	Asthma, hysteria, puerperal convulsions.				20-60
Viburnum Prunifolium (Black Haw).	As a tonic, nerve sedative, astringent, etc.				20-60
White Oak.....	See QUERCUS.				
Wich-Hazel.....	As a gargle in sore throat. Locally for sprains, bruises, etc. Internally to check bleeding.	(water) 1-1	(fl. extr.) 5-40		
Wild-Cherry Bark.	See PRUNUS VIRGINIANA.				
Wine of Coca.....	Mental and physical fatigue.....	2-8			

DRUG	USES	DOSES			
		Liquids		Solids	
		Drams	Drops	Drams	Grains
Wine of Colchicum Seed.	As COLCHICUM.....		20-60		
Wine of Iron.....	In chlorosis when the stomach is weak.	1-4			
" of Iron, Bitter.	General debility, convalescence after acute febrile diseases.	1-4			
Wine of Ipecac....	As IPECAC.....	{ emet ad. 8 ch. 1	} expect. 10-30		
" of Opium....	As OPIUM (less apt to nauseate)....		5-20		
Wintergreen.....	See OIL OF WINTERGREEN.				
Winter's Bark.....	Digestant and tonic.....				20-30
Xanthoxylum.	As a diaphoretic, nerve stimulant, and emmenagogue. Also locally to produce counter-irritation.				20-60
Yam, Wild	See DIOSCOREA.				
Yellow Lotion of Mercury.	Locally to sluggish venereal sores. ...				
Yerba Santa.....	Asthma, inflammatory conditions of the respiratory tract, etc.	{ (fl. extr.) 1-1			{ (extr.) 5-15
Zea (Corn-Silk)...	As an anodyne and diuretic in chronic disorders of urinary organs.	{ (fl. extr.) 1-2			
Zinc Acetate.	Locally as astringent and irritant. In solution for injection in gonorrhea.				
" Carbonate....	In ointment to protect superficial burns, sluggish ulcers, etc.				
" Chlorid.....	Locally as a caustic to destroy cancerous growths, etc.				
" Iodid.....	Locally as a mild caustic to enlarged tonsils, etc. In solution for injection in gonorrhea.				
" Oxid.....	Locally, in powder or ointment, to allay itching, promote healing of sores, fissures, etc. Internally in diarrhea, excessive perspiration, etc.				1-4
" Phenolsulfonate.	In solution as application to inflamed mucous membranes of vagina, urethra, throat, etc. Internally in diarrhea.				1-4
Zinc Sulfate.....	As an astringent in serous diarrhea, and as an emetic in cases of poisoning, etc. In weak solution as an injection in gonorrhea, and as application to ulcers and moist skin eruptions.				{ 1-2 emet. 10-30
" Valerate.....	Neuralgic pains and headaches of hysterical women.				1-5
Zingiber.....	See GINGER.				

GLOSSARY

GLOSSARY

In compiling this glossary the aim has been to include only terms that are not commonly understood and that, therefore, require explanation. No attempt has been made to compile a complete dictionary of medical terms. The names of diseases not included in the following pages will be found explained in the main vocabulary.

A

abdomen.—The cavity between the diaphragm and the floor of the pelvis: the belly.

abduction.—The muscular drawing away of a part from the axis of the body.

abductor.—A muscle that abducts.

abortion.—The act of giving birth prematurely; miscarriage.

abrasion.—A superficial injury caused by friction.

absorbent.—A substance taken internally to absorb acidity or a morbid discharge, or applied externally to reduce swelling.

absorption.—The act of taking up and carrying into the circulation.

accessory.—Assisting the principal agent; additional; supplemental.

acclimatize.—To habituate to a new or foreign climate.

acrid.—Pungent or bitter; irritative; corrosive.

acromion.—The projecting outer end of the shoulder-blade.

acute.—Coming to a crisis quickly; violent: said of a disease.

adduction.—The act of drawing toward the line of the axis: said of the action of muscles.

adductor.—A muscle which adducts.

adhesion.—(1) The union of fractured or severed parts. (2) A growing together of parts or of organs, normally separate.

adhesive.—(1) Having the quality of adhering; sticky. (2) Prepared to adhere; gummed: said of plaster.

adjuvant.—A medicinal substance designed to assist the principal means.

adult.—A fully developed person.

affection.—A morbid condition of any part; disease.

affusion.—The act or process of pouring water upon a patient's body.

albumin.—The transparent substance which forms the chief constituent of the white of an egg.

albuminous.—Containing, or consisting of, albumin.

alimentary.—(1) Nourishing; nutritious. (2) Connected with the processes of nutrition, as *alimentary* organs.

alkali.—A chemical substance capable of neutralizing acids.

alterative.—A medicine which tends to change nutritive processes and bodily habits to a normal state.

amputation.—The process of removing by cutting, as a limb.

analysis.—The determination of the elements of a compound.

anaphrodisiac.—A drug which tends to diminish sexual desire.

anatomy.—(1) The science which treats of the structure of the human body. (2) Bodily structure or manner of organization.

anesthesia.—Loss of sensation, especially that produced by a drug, as ether.

anesthetic.—An agent which produces anesthesia.

anodyne.—An agent that relieves pain by blunting or diminishing sensibility, as an opiate.

antacid.—An alkaline remedy for counteracting acidity, as of the stomach.

anthelmintic.—A remedy which tends to expel intestinal worms.

anti-—A prefix signifying opposition to.

antidote.—An agent which counteracts the effects of poison or the like.

antisepsis.—(1) The exclusion, especially from wounds, of micro-organisms which cause blood-poisoning. (2) Antiseptic surgery.

antiseptic.—An agent used in antisepsis; anything which destroys putrefactive bacteria.

antispasmodic.—An agent tending to prevent or relieve spasmodic affections.

anus.—The opening at the extremity of the intestinal canal, through which the excrement is expelled.

aperient.—A gentle purgative medicine.

apex.—The highest point of an organ.

aphrodisiac.—An agent which tends to induce or stimulate sexual desire.

aqueous.—Watery.

areola.—The colored circle about the nipple, or about a vesicle or pustule.

artery.—A vessel which conveys blood away from the heart.

arthritic.—Pertaining to the joints, or to inflammation of a joint.

articulation.—Any form of joint; the union forming a joint, as of bones.

ascites.—Dropsy of the abdomen.

asepsis.—Absence of blood-poisoning; exemption from putrefaction.

aseptic.—Free from disease-germs.

asphyxia.—Suspension of respiration and animation; suffocation.

aspirator.—A device for drawing off fluid matter from tumors, abscesses, etc., by means of an exhaustion-pump or suction-syringe.

assimilation.—The transformation of digested nutriment into an integral part of the solids or fluids of the body.

asthenia.—General debility; weakness.

astringent.—A medicinal substance having the power to diminish secretion; constipative; binding.

atrophy.—A wasting or withering of the body.

auditory.—Of or pertaining to hearing or the organs or sense of hearing.

aura.—A premonitory symptom in some nervous diseases.

auricle.—(1) One of the two chambers of the heart which receive the blood from the veins. (2) The external ear.

auscultation.—The act or process of listening for sounds produced in some part of the body in order to detect any abnormal condition.

axilla.—The armpit.

axillary.—Pertaining to the axilla, or armpit.

B

balsam.—An aromatic and oily medicinal preparation, used for stimulation of a wound or mucous membrane.

bicuspid.—Having two cusps or points; double-pointed, as a premolar tooth, and the valve at the left auricular opening of the heart.

bifurcation.—A forking; dividing into two branches.

bilateral.—Two-sided.

biliary.—Of, pertaining to, or conveying bile; as, the *biliary* duct.

bilious.—Suffering from indigestion, headache, and drowsiness, and having a furred tongue, bad taste in the mouth, etc.

blister.—(1) A thin vesicle on the cuticle, containing serum or watery matter. (2) A substance used for producing vesicles, as a counter-irritant.

bougie.—A slender, flexible surgical instrument to be introduced into the urethra, esophagus, or other canal of the body, for removing obstructions, or for dilating such openings.

brachial.—Of or pertaining to the arm, especially the upper arm.

breech.—The lower part of the body; the buttocks.

bronchus.—One of the two subdivisions of the windpipe, which convey air to the lungs.

bursa.—A pouch or sac; especially a synovial cavity formed where tendons pass over the harder parts of the body.

butyric.—Of, pertaining to, or derived from butter.

C

cæcum.—The blind pouch situated between the large and small intestines; the blind gut.

calcareous.—Composed of, containing, or of the nature of lime or limestone.

calcification.—The conversion into chalky, stony, or bony substance by the deposit of lime-salts, as in petrification and ossification.

calculus.—A concretion formed in various parts of the body, as the kidneys, gall-bladder, joints, etc., resembling a pebble in hardness.

callosity.—A thickened, hardened portion of the skin, as produced by pressure or friction.

callous.—Hardened, as the skin when habitually rubbed or pressed.

callus.—The new bony tissue formed between and around the fractured ends of a broken bone in the process of reuniting.

cancerous.—Of, pertaining to, of the nature of, or affected with a cancer.

canker.—Any ulcerous sore with a tendency to gangrene.

capillary.—Of, pertaining to, or like hair, specifically, having a hair-like bore; as a *capillary* vessel.

capsule.—(1) An enclosing membrane or structure; as the *capsule* of a joint. (2) A small gelatinous case for containing a dose of a nauseous drug.

carbohydrate.—A compound containing carbon, hydrogen, and oxygen.

carbon dioxid.—Same as carbonic acid.

carbonic acid.—A heavy, colorless, incombustible gas produced in the respiration.

carcinomatous.—Cancerous.

cardiac.—Pertaining to, situated near, or affecting the heart.

carminative.—A remedy which tends to relieve flatulence.

carpus.—The wrist.

cartilage.—An elastic animal tissue of firm consistence; gristle.

castration.—The act of removing the sexual germ-bearing glands.

catamenia.—The menses.

cataplasm.—A poultice.

cataplexy.—Sudden prostration by disease; a nervous shock causing paralysis.

cataract.—Opacity of the crystalline lens of the eye or its enclosing capsule.

catarrh.—Exaggerated secretion from a mucous membrane.

catarrhal.—Of, pertaining to, or of the nature of catarrh.

catastaltic.—Efficacious in checking morbid evacuations; astringent; styptic.

category.—Any comprehensive class or description of things.

catharsis.—Purgation or cleansing of any passage of the body, especially of the alimentary canal.

cathartic.—A medicine causing increase of movements of the intestine.

catheter.—A slender tubular instrument for introduction into canals or passages; used chiefly for passing through the urethra into the bladder to draw off the urine.

caul.—That part of the amniotic sac which sometimes envelops a newly born child.

caustic.—A substance that burns animal tissues by chemical action; a corrosive.

cauterization.—The act of burning with a caustic drug or with a heated iron, as a wound.

cell.—The smallest element of an organized body that manifests independent vital activities.

cellular.—Of, pertaining to, or like cells; consisting of, or containing cells.

cerebellar.—Of or pertaining to the cerebellum.

cerebellum.—A principal organ of the central nervous system; the little or hinder brain.

cerebral.—Of, pertaining to, or like the cerebrum or brain; also, produced in connection with brain-activity; mental.

cerebrum.—The upper and anterior part of the brain.

cerumen.—The waxy substance secreted by glands lining the passage of the external ear; ear-wax.

cervical.—Of, pertaining to, or situated in or near a neck or cervix.

cervix.—The neck, especially the back of the neck, or a neck-like part, as of the uterus.

charlatan.—One who makes unwarranted or extravagant pretensions, as to the possession of knowledge or skill; a quack.

cholagogue.—A purgative which causes evacuations of bile.

chronic.—Prolonged; lingering; said of disease.

chyle.—A nutritive milky fluid contained in the small intestine during digestion, formed by the action of the pancreatic juice, and the bile on the chyme.

chyme.—The partly digested food in liquid form as it passes from the stomach into the small intestine for conversion into chyle.

cicatricial.—Relating to, resembling, or forming a scar.

cicatrix.—A scar or seam consisting of

new tissue formed in the healing of wounded or ulcerous parts and remaining after their cure.

cilia.—Fine hair-like processes.

ciliated.—Provided with cilia.

clavicle.—The collar-bone.

clinical.—Of or pertaining to a sick-bed.

clonic.—Characterized by alternate convulsive contractions and relaxations of the muscles; said of spasms.

clyster.—An intestinal injection; enema.

coagulate.—To change (a liquid, as blood or milk) into a clot or a jelly, as by heat, by chemical action, or by a ferment; curdle; congeal.

coagulum.—A coagulated mass, usually clotted blood.

coalescence.—The structural union of like parts or organs.

coccygeal.—Of, pertaining to, or situated near the coccyx.

coccyx.—The lowermost end of the spine.

coition.—Sexual intercourse.

colic.—Acute spasmodic pain, as in the bowels; stomach-ache; gripes.

colicky.—Resembling colic.

collapse.—An extreme and generally sudden prostration of vital power.

colon.—The large intestine, excluding the cæcum and rectum.

coma.—A condition of heavy unconscious sleep, with slow, stertorous breathing; stupor; lethargy.

comatose.—Relating to or affected with coma.

compress.—(1) A soft pad, as of linen or lint, for making local pressure. (2) A wet cloth, covered with oiled silk or other envelope, applied to the body, as to lessen inflammation.

condyle.—An enlarged and prominent end of a bone.

congenital.—Born with one; existing from birth.

congestion.—An abnormal accumulation of blood in the vessels of an organ.

conjunctiva.—The mucous membrane which lines the eyelids and covers the anterior part of the eyeball.

constriction.—A narrowing or contraction.

constrictor.—A muscle that constricts an organ or opening; a sphincter.

contagion.—The communication of disease from person to person by contact, direct or indirect.

contagious.—Transmissible by contact, as a disease.

contamination.—The act of making impure, or polluting.

contusion.—An injury, as from a blow with a blunt instrument that does not make an open wound; a bruise.

convalescence.—The state of progressive restoration to health and strength after the cessation of a disease.

convulsion.—A violent and abnormal

muscular contraction of the body, followed by relaxation; spasm; fit.

corium.—The sentient and vascular portion of the skin beneath the epidermis.

cornea.—The anterior horny transparent part of the outer coat of the eyeball.

corneal.—Of or pertaining to the cornea.

corpuscle.—A minute body; a cell, either free, as a blood-corpuscle, or in intimate relation with others, as a bone-corpuscle.

corrosive.—An agent which has the power to destroy tissue.

cosmetic.—*n.* A powder, paste, or other compound applied to the skin in order to improve its appearance. *a.* Pertaining to the art of beautifying.

costal.—Of, pertaining to, or situated near a rib.

counter-irritant.—A medicinal agent employed to excite irritation in one part of the body, so as to relieve pain in another part.

cranial.—Of or pertaining to the cranium or skull.

cranium.—The skull.

crisis.—Any sudden or decisive change in the course of a disease, favorable or unfavorable.

culture.—The process of securing the growth and multiplication of bacteria in artificial media, as gelatin, beef-tea, etc.

cutaneous.—Consisting of, pertaining to, affecting, or of the nature of skin.

cuticle.—The outer skin; epidermis.

cyst.—(1) Any membranous sac or vesicle; as the biliary *cyst*; the urinary *cyst*. (2) Any abnormal sac or vesicle in which morbid matter may be collected and retained.

cystic.—Of or pertaining to a cyst; as, the *cystic* duct.

D

debility.—Lack of force or vigor; abnormal weakness in the vital functions.

decocion.—The liquid produced by boiling a substance until its soluble properties are extracted; especially, such a solution of vegetable principles in water: distinguished from *infusion*.

decomposition.—The act, process, or result of resolving or separating anything that is compound into its original parts or elements, as by chemical action or natural decay.

degeneration.—Morbid impairment of any structural tissue.

deglutition.—The act, process, or power of swallowing.

dejecta.—Excrements.

dejection.—Discharge from the bowels; excrement.

deleterious.—Hurtful; injurious; unwholesome.

delirious.—Suffering from delirium; wandering in mind; light-headed; raving.

delirium.—A morbid condition, often the result of fever, in which mental action is irrational, incoherent, and characterized by illusions, hallucinations, and erratic fancies; wandering of the mind.

delusion.—A false conception and persistent belief, unconquerable by reason, of what has no existence in fact.

demulcent.—Any medicinal remedy possessing soothing, pain-allaying qualities.

dental.—Of, pertaining to, or formed by the teeth.

dentition.—The process or time of cutting the teeth; teething.

deobstruent.—Having the power to remove obstructions.

deodorant.—An agent which destroys unhealthful odors.

depilation. The practise of pulling out or removing hair from the body.

depletion.—The act of relieving a plethoric condition, as by bloodletting or by dieting.

depuration.—The act or process of purifying; hence, the process of nature whereby the organs of the body are purified, as by some spontaneous evacuation or by aid of remedial agents.

desiccation.—The process of drying or evaporating.

desquamation.—The scaling-off of the scarf-skin, as in measles or scarlatina.

detergent.—A medicine possessing the power of cleansing morbid parts, as granulating wounds, ulcers, etc.

determination.—Tendency or increased flow to a part, as of blood.

diagnosis.—The act or process of discriminating between diseases and distinguishing them by their characteristic signs and symptoms; determination of the distinctive nature of a disease.

dialysis.—(1) Debility; weakness, especially, of the limbs. (2) An open wound; a solution of continuity.

diaphoresis.—Copious perspiration, especially when produced artificially.

diaphoretic.—A medicine that increases perspiration.

diaphragm.—The muscular partition between the chest and abdomen.

diaphragmatic.—Of or pertaining to the diaphragm.

diathesis.—A predisposition to certain forms of disease.

dietary.—A system of diet.

dilatation.—The process of dilating; also, an enlargement or distention of any canal or cavity of the body.

discutient.—A remedy administered or applied to dispel or scatter tumors or other swellings.

disinfectant.—A substance used to disinfect or to destroy the germs of infectious diseases.

disinfection.—The act or process of re-

moving or destroying the poison of infectious diseases.

disintegration.—The act of reducing to component parts or particles.

dislocation.—The displacement, either partial or complete, of one or more of the bones of a joint.

dissection.—The act or operation of cutting in pieces, specifically of an animal for examination.

distention.—The act of stretching, or the state of being stretched; expansion; inflation.

distillation.—(1) The act of extracting or producing by vaporization and condensation; as to distil brandy from wine. (2) The act of purifying by such a process, as water.

distortion.—(1) A twisting or forcing out of shape; as muscular *distortions*. (2) An unnatural curvature of a bone or deviation of an organ; as spinal *distortion*.

diuresis.—Excessive excretion of urine.

diuretic.—A medicine that stimulates the secretion of urine.

diurnal.—Increasing in violence by day; as, a *diurnal* fever.

dormant.—Not aroused to action, though capable of it; not used; as, *dormant* energies.

dorsal.—Of, pertaining to, or situated on or near the back, as, *dorsal* vertebræ (those to which ribs are attached).

drastic.—Acting vigorously; effective; as, a *drastic* cathartic.

dropsical.—Resembling or related to dropsy.

dropsy.—An abnormal accumulation of serous fluid in some cavity of the body.

drug.—Any substance used as medicine.

duct.—A tubular passage for fluid, especially one by which a secretion is carried away from a gland.

duodenum.—The first portion of the small intestine, between the stomach and the jejunum.

dyspnoea.—Labored, difficult breathing; asthma.

dysuria.—Difficult, painful, or incomplete urination.

E

eclampsia.—An acute nervous affection attended by convulsions, with loss of consciousness.

eclamptic.—Relating to or suffering from eclampsia.

ecstasy.—An exalted condition of mind.

edema.—General swelling or puffiness of parts, due to accumulation of serous fluid in the cellular tissue; dropsy.

effervescence.—The escape of bubbles of gas from a liquid otherwise than by boiling.

effete.—Worn out; exhausted; sterile; barren.

efficacious.—Producing or capable of producing an intended effect; effective.

effluvia.—Noxious or ill-smelling exhalations from decaying or putrefying matter.

effusion.—The pouring out of the blood or other fluid from its proper vessels into the cellular tissue or into a cavity.

ejaculation.—The expulsion of the seminal fluid through the urethra.

ejaculatory.—Pertaining to ejaculation.

elimination.—The act of getting rid of or casting out; excretion.

embolism.—An obstruction or plugging up of an artery or other blood-vessel by an embolus which has been carried along in the circulation.

embolus.—Any solid body (as a piece of fibrin or a blood-clot) that forms an obstruction in a blood-vessel.

embrocation.—(1) A liquid medicinal preparation to be applied by rubbing it on an affected part; especially, a liniment. (2) The act or process of applying such a preparation.

embryo.—The germ of a human being during the first two months of its existence.

emesis.—Vomiting.

emetic.—A medicine or other substance that produces or is used to produce vomiting.

emmenagogue.—Any medicine or substance that is supposed to stimulate or renew the menstrual flow.

emollient.—Any remedy which, when applied externally, softens or relaxes the tissues, allays irritation, or soothes inflamed tissues.

emphysema.—The condition produced by infiltration of air into the interstices of the connective tissue.

emphysematous.—Of or pertaining to emphysema; distended with air or gas; air-bloated; as, *emphysematous* lungs.

empyema.—A collection or formation of purulent matter, especially in the pleural cavity.

emulsification.—The process of forming an emulsion.

emulsion.—A liquid mixture in which a fatty or resinous substance is suspended in minute globules.

encysted.—Enclosed in a membranous sac or cyst; as, an *encysted* tumor.

endemic.—Peculiar to or prevailing in or among some (specified) country or people.

endermic.—Acting by being absorbed through the skin: said of any remedy applied to the skin, usually after blistering.

enema.—A liquid injected into the rectum; a clyster.

engorgement.—The condition of being excessively full or congested.

enteric.—Of, pertaining to, or near the intestine.

enteritis.—Inflammation of the small intestines, also of the mucous membrane.

enterotomy.—The operation of opening an intestine to effect fecal evacuation, as in stricture.

entheomania.—Religious insanity.

enucleation.—The operation of extracting a tumor in entirety after opening its sac, but without further cutting.

enzym.—An unorganized or chemical compound of vegetable or animal origin that causes fermentation.

epidemic.—Wide-spread occurrence of a disease in a certain region.

epidermal.—Of, pertaining to, of the nature of, or derived from epidermis.

epidermis.—The thin outer layer of the skin, which is not supplied with blood-vessels and nerves.

epigastric.—Of or pertaining to the epigastrium or the abdomen generally.

epigastrium.—The upper part of the abdomen, especially the region over the stomach and its walls.

epiglottis.—The leaf-shaped lid at the base of the tongue, that covers the larynx during the act of swallowing.

epileptic.—(1) Pertaining to or resembling epilepsy. (2) Affected with epilepsy.

epileptiform.—Resembling epilepsy.

epistaxis.—Nose-bleed.

epithelial.—Pertaining to epithelium.

epithelium.—The cells that line the alimentary canal and passages connected therewith: often extended to include the cuticle that covers the surface of the body, or the cells that form the lining membrane of any cavity or tube of the body.

equilibrium.—(1) A state of balance produced by the counteraction of two or more forces. (2) Equal balance of the mind.

eradication.—The act of rooting out, or the condition of being rooted out; extirpation; extermination; destruction; removal.

erector.—A muscle that erects a part or keeps it erect; as, the *erector spinæ* (a muscle that keeps the spine erect).

erosion.—The eating away of substance by corrosive agents or by ulceration.

erotomania.—A form of mental disease associated with abnormal sexual impulses.

erratic.—Coming and going at irregular intervals; wandering; shifting; as, *erratic* neuralgic pains.

eructation.—The act of belching or throwing off wind from the stomach.

eruption.—(1) A sudden bursting forth of fluid from any organ or cavity. (2) The breaking out of a rash or skin-disease; also, the rash or breaking out on the skin, as in measles.

eschar.—The disorganized crust of dead matter produced by the mortification or cauterization of a part; a slough.

esophagus.—The gullet.

esthesia.—Feeling or sensation; capacity for feeling.

etiology.—The branch of medical science that inquires into and treats of the causes of disease.

Eustachian tube.—A passage by which the pharynx communicates with the middle ear.

evacuant.—A medicine that produces evacuation.

evacuation.—The act of making empty, as the bowels.

evaporation.—(1) The act or process of changing or being changed into vapor; a rising of or passing off in vapor. (2) The act of drying or concentrating by expelling moisture.

exacerbation.—A temporary increase in violence of the symptoms of a disease.

exanthema.—A breaking out upon the skin; a rash, or a disease accompanied by rash, as measles.

excision.—The act of removing a part, as by cutting.

excitant.—A remedy tending to excite or stimulate.

excrement.—Any refuse matter discharged from an animal body; specifically, the feces.

excreta.—All useless matter eliminated from the bodily system.

excretion.—(1) The act of getting rid of waste matter. (2) Matter excreted, such as sweat and urine.

excretory.—Of or pertaining to excretion; conveying an excreted substance; as, an *excretory* duct.

exfoliation.—A scaling off, as of the skin.

exhalation.—A breathing out.

expectorant.—A medicine used to promote expectoration.

expectoration.—The act of spitting; also, matter expectorated; sputum.

expiration.—The act of breathing out, as air from the lungs: opposed to inspiration.

exsanguinity.—Deficiency of blood; anemia.

extensor.—A muscle that causes extension.

extravasation.—The state or process of escaping from the proper vessel; as, the *extravasation* of blood.

extremities.—The limbs.

F

fascia.—Condensed connective tissue forming sheets or layers for the investment of organs or the insertion of muscles.

fauces.—The parts bordering on the opening between the back of the mouth and the pharynx.

febrifuge.—Any medicine that is efficacious against fever.

febrile.—Of or pertaining to fever; caused or accompanied by or indicating fever; feverish.

fecal.—Of or pertaining to feces.

feces.—The alimentary refuse ejected at the anus; animal excrement.

feculent.—Turbid; foul; filthy; fecal.

femoral.—Of or pertaining to the femur or thigh; as, the *femoral* artery.

femur.—The thigh-bone.

ferment.—Any substance capable of producing fermentation.

fermentation.—A chemical decomposition of an organic compound, induced by living organisms or by chemical agents.

ferruginous.—Containing or having the nature of iron.

ferrum.—Iron.

fetal.—Of or pertaining to a fetus.

fetid.—Emitting an offensive odor; stinking.

fetor.—A powerful offensive odor; stench.

fetus.—The unborn offspring after the second month; an embryo in an advanced stage of development.

fever.—Body-temperature above the normal.

fibrination.—The acquisition of an excess of fibrin: said of the blood in some diseases.

fibula.—The outer of the two bones that form the skeleton of the lower leg.

fistula.—Any abnormal opening into a natural canal or hollow organ.

flaccid.—Lacking firmness or elasticity; relaxed; limber; flabby.

flatulence.—Accumulation of gas in the stomach and bowels.

flatus.—Wind or gas in the stomach or bowels.

flection, flexion.—The act of bending or the state of being bent.

flexor.—A muscle that operates to produce flection.

flux.—An abnormal flow of some fluid of the body; a morbid discharge of fluid matter.

follicle.—A minute cavity, sac, or tube; as, a hair-follicle; especially, a simple gland or glandular cavity; as, a sebaceous follicle.

fomentation.—(1) Treatment with hot water, either simple or medicated, as of a diseased part: generally by means of cloths or sponges; also, the use of any warm, moist application, as a poultice. (2) The lotion or substance applied.

foramen.—An orifice or short passage, as in a bone.

foramen magnum.—The large orifice by which the spinal cord passes into the skull and becomes continuous with the medulla oblongata.

forceps.—Pincers for grasping or removing bodies that can not well be otherwise reached or handled. Forceps are used by dentists in extracting teeth; by surgeons in removing splinters or other foreign substances, as from a gunshot wound; and in obstetrics to embrace the head of the fetus and aid its passage through the pelvis.

formication.—An itching sensation like the creeping of ants.

fossa.—A shallow depression, pit, or cavity; as, the pituitary fossa; the nasal fossæ.

fracture.—The breaking of a bone; a break in a bone. It is **simple fracture**

when only the bone is broken without external wounding; **compound f.**, when an external wound communicates with it; **comminuted f.**, when the bone is broken into several pieces; **complicated** or **compound comminuted f.**, when, in addition to a fragmentary fracture of the bone, there is lesion of the soft parts, including blood-vessels or nerves; **spiral f.**, when occasioned by a twisting movement, giving the broken ends a spiral appearance.

frenum.—A restraining band or fold; as, the *frenum* of the tongue.

fumigate.—To subject to the action of smoke or fumes, especially for disinfection.

fundus.—The rounded base or bottom or farther end or part of a hollow organ; the portion at a distance from the entrance; as, the *fundus* of the eye.

fungoid.—Resembling a mushroom or fungus; as, *fungoid* growths or granulations.

fungus.—A soft, spongy, morbid growth or abnormal excrescence.

G

gangrene.—The death of or partial cessation of vitality in a part, leading to its decay and corruption.

gangrenous.—Relating to, affected with, or partaking of gangrene.

gargle.—Any liquid, especially if medicinal, applied by gargling to the tonsils and upper parts of the throat.

gastric.—Of, pertaining to, or near the stomach.

gastro-intestinal.—Of or pertaining to both the stomach and the intestines.

gastrostomy.—The making of a permanent opening in the stomach for the introduction of food.

gastrotomy.—(1) The operation of the Cæsarean section. (2) The cutting into the abdomen to relieve hernial strangulation. (3) The opening of the stomach by incision, as to remove a foreign substance.

genital.—Of or pertaining to the animal reproductive organs or to the process of generation.

genitals.—The external organs of generation; sexual organs.

germicide.—That which is capable of killing germs; any agent used to destroy disease-germs or other micro-organisms.

gestation.—The act of carrying young or ova, especially of carrying a fetus in the uterus; pregnancy.

glandular.—Of, pertaining to, bearing, or of the nature of glands.

glottis.—The cleft or opening between the vocal cords at the upper orifice of the larynx; the mouth of the windpipe.

gluten.—A gray, tough mass, a mixture of various albuminoids, that remains after wheat-flour has been washed in

water. It gives dough its toughness, and is the chief proteid element of wheat.

glutinous.—Resembling glue; sticky; viscid.

glycerite.—A medicinal preparation containing glycerin.

gonorrheal.—Relating to, proceeding from, or affected with gonorrhea.

granular.—Composed of, like, or containing grains or granules.

granulation.—The process of forming new tissue in the healing of wounds.

gumma.—A tumor due to syphilis.

H

hallucination.—(1) An apparent perception (presentation of sense) occasioned by a morbid condition of the nervous system, and without any corresponding external object, as the sights seen and sounds heard by one in delirium tremens.

hashish.—(1) The tops and tender sprouts of *Cannabis Indica* or Indian hemp, and also the resinous matter exuding from them; gunja. (2) An intoxicating preparation of this plant, either smoked or drunk or taken in confections.

hectic.—(1) A form of fever that occurs in connection with some organic disease that is attended by continuous and exhausting drain upon the system, as by chronic suppuration in pulmonary consumption, or abscess of the liver or kidneys. (2) The bright pink-red spot that appears on the cheek during a paroxysm of hectic fever.

hemoglobin.—A compound, amorphous in structure, forming the solid coloring-matter of red blood-corpuscles. It serves as a carrier of oxygen from the lungs.

hemorrhage.—Discharge of blood from a ruptured or wounded blood-vessel; bleeding.

hemostatic.—A medicine that stops bleeding; a styptic.

hepatic.—Of or pertaining to the liver; as, *hepatic* disease.

heredity.—Transmission of physical or mental peculiarities, qualities, diseases, etc., from parent to offspring.

hernia.—Protrusion of any internal organ in whole or in part from its normal position; rupture; as, *hernia* of the intestines.—**strangulated hernia**, a hernia of the bowel so constricted at a limited point as to suppress fecal evacuation and to interrupt the circulation.

humerus.—The bone that constitutes the skeleton of the upper part of the arm.

humor.—Moisture; specifically, an animal fluid; as, the serous *humor*; the vitreous *humor* of the eye.

hydragogue.—Any medicine that causes abundant watery evacuations.

hydro.—Water; a combining form.

hydrotherapeutics.—Remedial treatment of disease by water in various modes and forms.

hydrothorax.—Dropsy of the chest.

hygiene.—The branch of medical science that relates to the preservation and improvement of health, both in individuals and in communities; sanitary science.

hygroscopic.—Able to absorb or condense moisture from the atmosphere.

hymen.—A thin membrane, especially that which usually partially closes the vagina in virgins. In the embryo it marks the separation of the genital canal from the urogenital sinus.

hyperacidity.—Excessive acidity.

hyperesthesia.—Exaggerated sensibility.

hyperemia.—Abnormal accumulation of the blood in any part of the body, characterized as *active* when due to increased flow of blood to a part, and *passive* when due to obstruction in the return of blood from a part.

hypertrophy.—The morbid enlargement of a part from increased nutrition without increase of waste; an abnormal increase of a part from enlargement of its elements: opposed to *atrophy*.

hypodermic.—Of or pertaining to the area under the skin; introduced or found under the skin; as, a *hypodermic* syringe or injection.

hypogastrium.—The region at the lower part of the abdomen on the middle line.

I

ichor.—A watery acrid humor discharged from sores.

idiopathic.—Of or pertaining to idiosyncrasy, or a primary morbid condition.

idiopathy.—A primary disease; disease not generated by or depending on any other.

idiosyncrasy.—A mental quality or habit peculiar to an individual; constitutional peculiarity; distinctive characteristic.

ileum.—The lower three-fifths of the small intestine, excluding the duodenum; the part of the intestine between the jejunum and the cæcum.

ilium.—The large expanded upper portion of the hip-bone, separate in the fetus.

immunity.—Exemption, as from disease; especially, protected by inoculation.

inanition.—Exhaustion from lack of nourishment, whether by absence of food or disorder of the nutritive system.

incontinence.—Inability to retain the natural evacuations.

incubation.—The period between the time of exposure to an infectious disease and its development.

incus.—One of the small bones in the tympanum or middle ear, by which vibrations are transmitted to the filaments of the auditory nerve: so called from its fancied resemblance to an anvil.

indigenous.—Originating in a (specified) place or country; native.

infection.—Communication of disease, as by contact or through the medium of air, water, or clothing: distinguished from *contagion*; as, the malady spread by *infection*.

inferior.—Situated in a lower place; as, the *inferior* maxilla.

inguinal.—Of, pertaining to, or situated in the vicinity of the groin; as, the *inguinal* or crural arch; *inguinal* or abdominal rings.—**inguinal canal**, a passage through the abdominal wall, in the region of the groin, normally filled by the spermatic cord in the male and the round ligament of the ovary in the female: a frequent seat of hernia.

inhalation.—(1) The act of inhaling or drawing in the breath; indrawing, as of air, into the lungs; inspiration. (2) That which is inhaled; specifically, a medicinal vapor intended to be inhaled.

inhibition.—The stopping or checking of a function or action, either *reflex*, as that caused by external shock, or *voluntary*, when the will controls an action commonly performed automatically, as winking. In the latter form it is an essential element in freedom of will.

injection.—(1) The introduction by instruments of a fluid into some cavity or tissue of the body. (2) The fluid injected.

inoculation.—(1) The insertion of the virus of a particular disease (specifically, smallpox virus) into the system through the skin. (2) Infection.

insanitary.—Not sanitary; prejudicial to health; likely to cause disease.

insidious disease.—A disease that advances to its worst stage without alarming symptoms.

insomnia.—Inability to sleep, especially when chronic; sleeplessness.

inspiration.—The act of inbreathing; inhalation.

inspissation.—The act of giving greater consistency to by boiling or evaporation.

instillation.—The act of pouring in by drops.

integument.—Any outer covering or envelope; specifically, the natural covering, external envelope, or investment of an animal or vegetable body, as the human skin.

intercostal.—Occurring between the ribs; of, pertaining to, produced by, or, supplying parts between the ribs; as, an *intercostal* artery; *intercostal* respiration.

intermittent.—Having periods of intermission; as, *intermittent* fever.

interosseous.—Situated between bones; of or pertaining to parts so situated; as, an *interosseous* ligament.

intra.—A prefix signifying situation or occurrence within the part or organ to which it is prefixed; as, *intracardiac*, within the cardia or heart.

intubation.—The insertion of a tube in an orifice, as in the larynx in cases of diphtheria.

intussusception.—A receiving within; the state of being received within. Specifically: The invagination of a portion of an intestine or other tube into the portion adjoining it; as, *intussusception* of the bowel.

inunction.—The process of rubbing into the skin, as an ointment or liniment.

inure.—To harden or toughen by use, exercise, or exposure: habituate; accustom; as, to *inure* the body to cold.

irrigation.—The process of washing or of keeping moist, as a wound.

irrigator.—An apparatus for wetting.

irritant.—A mechanical, chemical, or pathological agent of inflammation, pain, or tension.

-itis.—A suffix used to denote inflammation, as *appendicitis*, inflammation of the appendix.

J

jejunum.—The upper two-fifths of the portion of the small intestine that succeeds the duodenum.

jugular.—(1) Of or pertaining to the throat. (2) Of, pertaining to, situated near, or connected with the jugular vein; as, the *jugular* foramen; the *jugular* gulf or sinus.

K

kyllosis.—Congenital distortion of the feet; clubfoot.

L

labia.—The folds of the external genitals of the female.

lacrimal.—Of or pertaining to tears; secreting or furnishing a passage to tears; pertaining or related to the tear-producing organs; as, *lacrimal* discharges; the *lacrimal* glands.

lactation.—(1) The secretion of milk. (2) The act of suckling young; the period of suckling.

lacteals.—Lymphatic vessels that take up and convey the chyle from the alimentary canal.

lancet.—A surgical instrument with one or more small, keen, often two-edged and sharp-pointed blades, used in blood-letting, opening abscesses and tumors, etc.

lanugo.—The soft, downy, rudimentary hair found on the body of a child at birth.

laparotomy.—The operation of opening the abdomen by incision in the loin.

larva.—The early form of any animal when it is unlike the parent, or undergoes a metamorphosis; in insects, the first stage after leaving the egg, preceding the pupa, as a caterpillar, a grub, or a maggot.

laryngeal.—Of, pertaining to, or near the larynx.

laryngoscope.—An instrument for inspecting the larynx, consisting in its or-

dinary form of a concave reflector from which light is reflected to a mirror in the patient's mouth and thence to the larynx, the observer looking through a small aperture in the concave reflector.

laryngotomy.—The operation of cutting into the windpipe to remove obstruction and relieve difficulty of breathing or prevent suffocation.

larynx.—The special organ of voice, situated at the upper part of the windpipe, consisting of a cartilaginous box across which are stretched folds of mucous membrane, the vocal cords, which, by their vibration, due to the passing of air from the lungs, produce sound.

lateral.—Of, pertaining to, proceeding from, or directed toward the side. Specifically: Situated to one side of the median plane of the body or of a limb.

laxative.—A medicine that opens or loosens the bowels.

laxator.—A muscle that relaxes or loosens an organ or part.

lens.—A biconvex transparent body situated behind the iris of the eye, by which the rays of light are focused upon the retina.

lesion.—A hurt, loss, or injury. Specifically: Any derangement or morbid change in function or structure of an organ or tissue.

lethargy.—(1) A state of morbid drowsiness, or unnatural and prolonged sleep, from which one can be roused only momentarily or not at all; stupor. (2) Prolonged sluggishness of body or mind; a state of inaction, indifference, or dulness; apathy.

leucocyte.—One of the minute, nucleated, colorless masses of protoplasm, capable of ameboid movements, found swimming freely in blood and lymph (white blood-corpuscles), in the reticulum of lymphatic glands (lymphoid cells), and in bone-marrow and other connective tissue (wandering cells).

Leucocytes prey upon and take into their substance bacteria and other microorganisms within the blood and tissues. They also absorb solid and fatty particles.

leucorrhea.—Catarrh of the vagina, attended by discharge of a greenish-white mucus; uterine catarrh; the whites.

levator.—A muscle that raises an organ or part.

lientery.—A diarrhea characterized by frequent liquid evacuations, with the food but partially digested.

ligament.—A band or sheet of firm, compact, fibrous tissue, closely binding related structures together, especially one connecting or investing the opposed surfaces of a joint.—**Poupart's ligament**, a thickened band of fascia that extends from the upper anterior part of the hip-bone over the vessels of the thigh to the pubis: named for Francois Poupart, a French anatomist (1616-1708).

ligature.—Anything that constricts, or

serves for binding or tying; specifically, a thread, usually of silk, catgut, or wire, tied around a blood-vessel or other part to arrest bleeding or for removing a tumor.

liniment.—A liquid, sometimes oily, preparation for rubbing on the skin in cases of bruises, inflammation, etc.

litholysis.—The resolving by remedial means of a stone in the bladder.

lithontriptic.—A remedial agent prescribed for dissolving calculi in the bladder and urinary passages.

lithotomy.—The operation of removing stone from the bladder by incision into the organ.

lithotrixy.—The operation of reducing stone in the bladder to fine fragments by crushing, sawing, etc., by means of instruments.

lobe.—A protuberance or projecting part, especially if rounded or globular, as of the ear; specifically, in anatomy, one of the subdivisions of an organ made by structural configuration; as, the lobes of the liver or of the brain.

lochia.—The cleansings or sero-bloodly discharges from the womb after childbirth, continuing from two to three weeks.

longitudinal.—Running lengthwise, as distinguished from *transverse*; as, the longitudinal diameter of a body.

lumbar.—Of, pertaining to, or situated in the region of the loins; as, the lumbar nerves.—**lumbar region**, the region of the loins exclusive of the umbilical region of the abdomen.—1. **vertebræ**, the vertebræ between the last thoracic vertebra and the sacrum.

lumen.—A passageway or opening, as in a tube. Specifically: The cavity of a tubular organ.

lymph.—(1) A transparent, colorless, alkaline fluid consisting of a plasma resembling that of the blood, and of corpuscles like the white blood-corpuscles. Lymph is absorbed from the various organs and tissues, and is conveyed by the lymphatic vessels toward the heart, and poured into the venous system by the thoracic and right lymphatic ducts. (2) The coagulable exudation from the blood-vessels in inflammation. (3) The virus or a culture of the virus of a disease, used in vaccination or similar treatment.

lysis.—The gradual abatement of a disease, as distinguished from *crisis*.

M

maceration.—(1) The act, process, or operation of steeping; a softening by digestion or infusion. (2) In pharmacy: The process of infusing a solid in a liquid to extract its medicinal qualities.

macrocephalia.—The quality or state of having an unusually large head.

malarial.—Caused by, affected with, or of the nature of malaria; as, malarial districts; malarial diseases.

malleolus.—One of two pointed processes that project downward from the bones of the leg, one on each side of the ankle.

malleus.—One of the small bones of the middle ear in mammals, attached to the tympanic membrane, whose vibrations it transmits to the incus.

Malpighian.—Of, pertaining to, or named after Marcello Malpighi (1628-'94), an anatomist and botanist of Bologna.

Malpighian body or corpuscle. (1) One of numerous structures found in the cortical substance of the kidney, each consisting of the dilated extremity of a uriniferous tubule investing a tuft or glomerulus of blood-vessels. (2) One of the spherical lymphoid nodules that surround the arterioles of the spleen; a splenic corpuscle.—**M. glomerulus or tuft**, the convoluted tuft found within a Malpighian corpuscle.—**M. layer**, the deeper softer layer of the epidermis, comprising the active cells.—**M. pyramid**, a primitive lobule of the kidney, consisting of a series of uriniferous tubules converging toward a single papilla.

mamma.—The human breast; the mammary gland.

mammary gland.—The milk-gland, which in a woman forms the bulk of the breast or mamma.

mania.—A symptom of mental disease associated with great restlessness and excitement.

maniac.—One afflicted with mania.

masticate.—To chew.

masturbation.—Onanism; self-abuse.

maxilla.—One of the jaw-bones, especially of the upper jaw.

maxillary.—Of, pertaining to, or situated near the jaw or a maxilla.

maximum.—The greatest quantity, amount, or degree that can be assigned in a given case or under fixed conditions.

meatus.—A conspicuous passage or canal; as, the auditory or the urethral *meatus*.

meconium.—The first feces of a newborn child.

medication.—The process of medicating or of being medicated; medical treatment.

medico-mechanical.—Relating to both medical and mechanical treatment.

medulla.—The inner portion of an organ or part; as, the *medulla* of the kidney.

melancholia.—A symptom of mental disease, associated with depression and slowness of thought and movement.

membrane.—A thin sheet-like structure, usually fibrous, connecting other structures, or serving to cover or line some part or organ.

membranous.—Of, pertaining to, composed of, characterized by, or like membrane.

meningeal.—Of, pertaining to, or situated near the meninges.—**meningeal vessels**, the arteries, veins, etc., supplying

the dura mater of the brain; especially, the great or middle meningeal artery.

meninges.—The membranes enveloping the brain and spinal cord; specifically, the dura mater, pia mater, or arachnoid.

menses.—The menstrual flow; the monthly courses.

menstrual.—Of or pertaining to the menses.

mesenteric.—Of, pertaining to, or resembling a mesentery.—**mesenteric artery**. One of the two large branches of the abdominal aorta that pass through the mesentery to supply the intestines.

mesentery.—A fold of the peritoneum that invests an intestine or other viscus and connects it with the abdominal wall; especially, the fold investing the small intestine.

metabolism.—The act or process by which on the one hand the dead food is built up into living matter, and by which on the other the living matter is broken down into simpler products within a cell or organism; the sum of the anabolic or constructive (assimilation) and the catabolic or destructive (decomposition) processes.

metacarpal.—Of or pertaining to the metacarpus.

metacarpus.—The part of the fore or thoracic limb between the carpus or wrist and the phalanges or bones of the finger. It consists in man of five bones.

metastasis.—The shifting or translation of a disease or of its manifestations from one part or from one organ to another, as sometimes in rheumatic gout.

metatarsal.—Of or pertaining to the metatarsus.

metatarsus.—The part of the hind or pelvic limb that is between the tarsus or ankle and the phalanges or bones of the toe. In man it consists of five bones.

microscope.—An instrument for assisting the eye in the vision of minute objects or features of objects that would be invisible without such aid.

micturition.—The act of urinating, especially in small quantities and frequently.

minim.—A drop.

miscarriage.—The act of bringing forth before the natural time; a premature birth; with women, the delivery of a fetus before the twenty-eighth week of pregnancy.

mitral valve.—A membranous valve, composed of two segments, that guards the orifice between the left auricle and the left ventricle of the heart.

morbid.—(1) Being in a diseased or abnormal state; not sound and healthful; diseased; sickly; as, a *morbid* liver. (2) Of or pertaining to disease; pathological; as, *morbid* anatomy.

mortification.—The death of one part of an animal body while the rest is alive; loss of vitality in a part as the result of

gangrene; death of a definite portion of the soft parts of the body.

mucoid.—Resembling mucus.

mucopurulent.—Relating to or consisting of both mucus and pus.

mucous.—(1) Secreting mucus or a similar slimy substance; as, the *mucous* membrane. (2) Of, pertaining to, or resembling mucus; viscous; slimy; gummy; as, *mucous* matter.—**mucous membrane**, a membrane secreting or producing mucus, that lines passages and cavities communicating with the exterior, as the alimentary canal, air-passages, and secretory ducts and receptacles.

mucus.—A specific viscid substance secreted by the mucous membranes.

mummification.—Dry gangrene; gangrene of old age.

murmur.—The sound heard in auscultation of an organ or a part, as characteristic of either health or disease; as, cardiac *murmur*; respiratory *murmur*; uterine *murmur*.

muscular.—Of, pertaining to, or depending upon muscles; as, the *muscular* system; *muscular* action; *muscular* exercise.

myalgia.—Pain in a muscle; cramp.

N

narcosis.—The aggregate of influence or effect from continuous use of narcotic substances; narcotic poisoning.

narcotic.—A substance, as opium or belladonna, that in medicinal doses allays morbid susceptibility, relieving pain and producing sleep. In poisonous doses it produces stupor, coma, and convulsions, and in still larger doses death. The medicinal use produces narcotism; the continued use, narcosis.

narcotism.—The state of being under the influence of narcotics; stupor due to narcotics.

nausea.—An affection of the stomach, as resulting from the presence there of undigested food, producing dizziness and usually an impulse to vomit.

navel.—The depression or scar on the abdomen where the umbilical cord of the fetus was attached; umbilicus.

nebula.—A speck on the cornea, or imperfect vision because of a speck on the cornea; visual opacity.

necrosis.—The death of part of the body; mortification; gangrene; as, *necrosis* of a bone.

nephritic.—Of, pertaining to, or affecting the kidneys.

nephritis.—Inflammation of the kidneys.

neurasthenia.—Nervous prostration or exhaustion; debility or inactivity of the nerves.

neuritis.—Inflammation of a nerve.

neurosis.—Disease of the nerves or nervous system; especially, nervous dis-

ease without lesion of parts, as epilepsy or neuralgia.

neutral.—Lacking decided acid or alkaline qualities, as shown by a failure to turn red litmus paper blue or blue litmus paper red; as, *neutral* urine.

neutralize.—To make neutral, as by the addition of an alkali to an acid solution, or the reverse.

nocturnal.—Of or pertaining to the night; occurring or performed at night: opposed to *diurnal*.

node.—(1) A firm flattened tumor on a bone, ligament, or tendon. (2) A hard concretion formed around gouty or rheumatic joints.

nodule.—A little knot, lump, or node.

non-pathogenic.—Not productive of disease; harmless: said of bacteria.

normal.—According to an established law or principle; conformed to a type or standard; regular or natural, as in character, formation, or action; as, his pulse is *normal*.

nostalgia.—Homesickness; excessive longing for home or country, inducing melancholy.

nostrum.—A medicine the composition of which is kept secret; a quack medicine.

nucleus.—(1) A central point or part about which matter is aggregated; a center of growth. (2) A differentiated round or oval body embedded in the protoplasm of a cell or a unicellular organism, and composed of nucleoplasm, chromatin, and linin. (3) A group of cells from which nerve-fibers originate.

nutrition.—(1) The process by which growth is promoted and waste repaired in live organisms.

It has been estimated that in a man weighing 140 pounds the weight of the flesh-forming matter of the blood is 4 pounds, that of the muscular tissue 27½ pounds, and that in the bones 5 pounds, making a total of 36½ pounds; and that in the course of 18 weeks these 36½ pounds are introduced into the system. (2) Nutriment.

nutritive.—(1) Having nutritious properties; nourishing; as, *nutritive* food. (2) Of or pertaining to nutrition; as, *nutritive* processes.

nystagmus.—A spasmodic movement of the eyes, rotatory or from side to side, frequently affecting miners and others working in a dim light and a stooping position.

O

obesity.—The state of being excessively fat; morbid corpulency.

obstetrics.—The branch of medical science concerned with the treatment and care of women during pregnancy and parturition; midwifery.

obstipation.—Obstinate constipation.

occipital.—(1) Of or pertaining to the occiput or lower back part of the head; as, the *occipital* bone. (2) Of, pertaining

to, or situated near the occipital bone; as, the *occipital* condyles for articulation with the atlas; the *occipital* lobe.—**occipital bone**, a bone of the occiput; the hindmost bone of the skull, through which the continuation of the spinal cord passes by an aperture (foramen magnum or occipital foramen).

occlusion.—The closing or shutting up of an opening, pore, passage, or cavity.

oculist.—One versed or skilled in treating diseases of the eye.

olfactory.—Of or pertaining to the sense of smell.—**olfactory bulb**, a club-shaped extension of the hemispheres of the brain, from which arise the special nerve-filaments that supply the organs of smell.—**o. nerve**, the first of the cranial nerves; the collected filaments given off from the olfactory bulb; inaccurately, the combined bulb and tract.

opacity.—The state or quality of being opaque; imperfect transmission of light; want of transparency or translucency; cloudiness; obscurity.

operative.—Connected with or relating to operations.

operation.—The application of instruments and manual manipulations for removing diseased parts or correcting abnormal conditions; as, the *operation* for calculus.

ophthalmia.—Inflammation of the eye, its membranes, or its lids.

ophthalmic.—(1) Of, pertaining to, or subject to ophthalmia. (2) Of or pertaining to the eye or the apparatus of vision.—**ophthalmic artery**, a branch of the internal carotid that supplies the eye and adjacent structures.—**o. ganglion**, a small ganglion in the orbit associated with the ophthalmic nerve.—**o. nerve**, one of the three grand divisions of the trifacial nerve, supplying the eyeball and the region near it.

ophthalmologist.—One versed in ophthalmology; an oculist.

ophthalmology.—The branch of medical science that treats of the eye, its structure, functions, and diseased conditions; the anatomy, physiology, and pathology of the eye.

ophthalmoscope.—An optical instrument having a concave mirror with a hole in its center, for illuminating and viewing the interior of the eye.

opiate.—A medicine containing opium; hence, any narcotic; something inducing sleep; an anodyne.

optic.—Of, pertaining to, or connected with the eye or vision; as, the *optic* nerve.

optic nerve, the special nerve of vision.

oral.—Of, pertaining to, or situated at, near, or around the mouth.

orbit.—One of the two cavities of the skull containing the eye and its associated organs.

orthopedia.—The correcting or preventing of deformity in any part of the body: a branch of surgical medicine.

orthopedic.—Relating to orthopedia.

orthopnea.—A morbid condition of the organs of respiration rendering breathing practicable only when a person is erect, either sitting or standing; dyspnea.

os.—(1) A mouth or opening into the interior of an organ; as, *os uteri*. (2) A bone.—**os calcis**, the calcaneum.—**os magnum**, the median distal bone of the wrist.

osmose.—The mixing or tendency to mix of two liquids or two gases by passage through a membrane or porous wall separating them.

osmosis.—Same as *osmose*.

ossicle.—A small bone; as, the *ossicles* of the internal ear.

ossification.—(1) The vital process by which calcareous matter is deposited in cartilage or in membrane, giving rise to bone. (2) Change of a tissue into a bony substance; as, *ossification* of the aorta. (3) The state of being ossified; also, an ossified part.

otoscope.—An instrument for viewing or examining the interior of the ear; especially, an ear-speculum.

ovarian.—Of, pertaining to, or affecting the ovary; as, an *ovarian* tumor; an *ovarian* tube.

ovariotomy.—The removal of the ovary by excision, requiring incision through the abdominal walls, detachment of adhesions, etc.

ovary.—The organ or gland of the female that gives rise to the ova or essential products of generation.

ovum.—A nucleated cell, formed in the ovary of the female, that may produce a new individual by a process of segmentation, usually after impregnation; an egg, in the widest sense.

oxygenation.—The act or process of impregnating with oxygen.

P

palatableness.—The quality of being agreeable to the taste; appetizing; savory.

palate.—The horizontal partition between the mouth and the nasal fossæ; the roof of the mouth.

The *hard palate*, or anterior part, has a bony skeleton; the *soft palate*, or posterior division, is composed of muscular tissue and mucous membrane.

palliative.—Something that lessens, alleviates, or partially cures disease or pain.

palmar.—Of, pertaining to, or situated near the palm or palma.—**palmar arch**, one of two arterial arcades (the *superficial* and the *deep*) between the radial and ulnar arteries across the palm of the hand.—**p. fascia**, thick, dense tissue found in the palm under the skin and extending to the bases of the fingers.

palpation.—The process of examining

or exploring morbid conditions by means of touch; a digital or manual exploration.

palpitation.—Rapid and irregular pulsation; quivering; throbbing; specifically, an abnormally rapid throbbing or fluttering movement of the heart, excited by violent action of the body, fear, fright, or disease.

panacea.—A remedy or medicine proposed for or professing to cure all diseases; cure-all; hence, a remedy or cure for all ills, mental or physical, also, loosely, for all cases of one class of ills.

pancreas.—A gland connecting with the alimentary canal; in man, a large racemose gland behind the peritoneum, between the lower part of the stomach and the vertebræ of the loins, and emptying into the duodenum by one or more small ducts; the sweetbread. Its function is to secrete the pancreatic juice.

pancreatic.—Of, pertaining to, or produced by the pancreas. **pancreatic juice,** a colorless fluid, resembling saliva, secreted by the pancreas, and forming an important factor in digestion, chiefly by emulsifying fats through a peculiar albuminoid principle that it contains.

paralysis.—Loss or material diminution of the power of contractility in the voluntary or involuntary muscles, and sometimes of the power of perceiving sensations, in one or more parts of the body; palsy.

parasitic.—(1) Living on or in another organism and deriving nourishment therefrom; of or pertaining to vegetable or animal parasites. (2) Relating to, of the nature of, or caused by parasites; as, a *parasitic* growth; a *parasitic* disease.

parenchyma.—The soft cellular substance of glandular and other organs; the proper substance of an organ, including connective tissue and the like.

parietal.—Of, pertaining to, or forming the walls of any cavity in the body; as, the *parietal* bones. **parietal bone,** either of two bones between the occipital and frontal bones that form a part of the top and sides of the cranium.

parotid.—A salivary gland below or in front of the ear. In man the parotid is the largest salivary gland, and its duct discharges into the mouth opposite the second upper molar.

paroxysm.—A periodic attack of disease; an exacerbation of the symptoms of a disease; a fit.

parturient.—Bringing forth or being about to bring forth young; of or pertaining to childbirth.

parturition.—The act of bringing forth young; delivery; travail; childbirth.

Pasteurization.—A process of arresting or preventing fermentation in beer or wine by heating to 140° Fahr. so as to destroy the vitality of the ferment: originally proposed by Louis Pasteur.

patella.—A flattened oval bone in front of the knee-joint; the kneecap; kneecap.

patency.—The state of being open.

pathogenic.—Productive of disease; of or pertaining to the production of disease.

pathological.—Of or pertaining to pathology; considered in relation to disease; as, a *pathological* condition.

pathology.—The branch of medical science that treats of morbid conditions, their causes, symptoms, nature, physiology, and anatomy.

pectoral.—Of or pertaining to the breast or thorax; as, a *pectoral* muscle; a *pectoral* disease.

pectoralis.—A pectoral muscle. The **pectoralis major**, or great pectoral, forms the principal muscular mass of the breast, and passes to the arm. The **pectoralis minor**, or lesser pectoral, is deeper, and extends from the third, fourth, and fifth ribs to the coracoid process of the scapula.

pelvic.—Of, pertaining to, or situated near the pelvis. **pelvic arch** or **girdle**, the part of the skeleton to which the pelvic limbs are attached; in man, the arch made by the os innominatum or haunchbone.

pelvis.—(1) The part of the skeleton that forms a bony girdle or basin by which the lower or hinder limbs are joined to the body: composed, in man, of the two hip-bones and the sacrum. (2) The hollow interior portion of the kidney, into which the uriniferous tubules empty: formed by the expanded part of the ureter.

percussion.—(1) In diagnosis, a light, quick tapping, as of the collected fingertips on the chest or abdomen, for determining, by the resonance, the condition of the organ beneath: called **mediate percussion** if a substance is interposed beneath the fingers; otherwise, **immediate percussion**. (2) In therapeutics, the remedial treatment practised by lightly slapping or striking the body or a part with the hand or an instrument.

pericardium.—A fibrous membrane bag that surrounds and protects the heart. It consists of two layers, of which the inner is serous and the outer fibrous. The serous layer invests the heart-muscle, and at its base, where the great vessels are, is reflected upon the fibrous layer, thus forming a closed sac containing a small quantity of fluid.

perineum.—The region of the body between the genital organs and the rectum.

periodicity.—The quality of being periodic, in any sense; the habit or characteristic of recurrence at regular intervals. Specifically: The aptitude or tendency of special phenomena, either normal or morbid, to recur at definite periods; as, the *periodicity* of a fever.

periosteum.—The membrane that invests and nourishes the bone.

peristalsis.—A peculiar contractile muscular movement of any hollow organ of the body, especially of the alimentary canal, involuntary, successive, and vermic-

ular, whereby the contents are gradually propelled toward the point of expulsion.

peritoneal.—Of or pertaining to the peritoneum.

peritoneum.—A serous membrane that lines the abdominal cavity, and is reflected as a more or less complete investment over the viscera. It forms a completely closed sac except in females, where the Fallopian tubes open into the cavity.

perspiration.—(1) The secretion and exhalation of fluid by the sweat-glands of the skin. (2) The fluid thus secreted and exhaled; sweat. Perspiration is continual. When evaporated as fast as exhaled, it is **insensible perspiration**; when it accumulates so as to form drops, it is **sensible perspiration** or **sweat**.

phalanx.—One of the bones of the fingers or toes.

pharmacopœia.—A book, usually published by authority, containing the formulas and methods of preparation of medicines, etc., for the use of druggists. The United States Pharmacopœia is revised decennially by a representative body of physicians and pharmacists assembled in convention.

pharyngeal.—Of, pertaining to, or situated in the region of the pharynx.

pharyngoscope.—An instrument for inspecting the throat.

pharyngotomy.—The operation of making an incision into the pharynx; also, of scarifying the tonsils, and of opening a pharyngeal abscess.

pharynx.—The part of the alimentary canal between the palate and the esophagus, serving as an air-passage to the larynx.

phimosis.—The abnormal constriction of the opening of the prepuce, preventing the uncovering of the glans penis: generally congenital.

phlebotomy.—The operation of opening a vein by incision as a remedial measure; bloodletting.

phlegm.—A viscid, stringy mucus secreted in the air-passages or the stomach, especially when produced as a morbid product: usually discharged by expectoration.

phlegmon.—A circumscribed inflammatory exudation in the connective tissue, with suppurative tendency.

-phobia.—Suffix signifying 'unreasonable fear or dread; morbid dislike.

phthisis.—Tuberculosis of the lungs; pulmonary consumption.

physiological.—Pertaining to or of the nature of physiology; of or pertaining to the functions of living organisms.

physiology.—The branch of biology that treats of the vital phenomena manifested by animals or plants; the science of organic functions.

It is primarily divided into **animal** and **vegetable physiology**, concerned respectively with animal and vegetable life. As restricted to a consideration of the

bodily functions in man, it is called **human physiology**. In the latter use it often broadly includes **physiology proper**, relating to the functions of the body, and **hygiene**, concerned with its care. *Anatomy*, relating to bodily structure, is correlated. Physiology was formerly not distinguished from physics, but as now divided they relate respectively to organized and unorganized bodies.

pigment.—Coloring-matter.

plasma.—(1) The liquid portion of nutritive animal fluids, as blood, lymph, or intercellular fluid, excluding organized solids. (2) The viscous material of a cell; protoplasm.

platysma.—A thin muscular sheet beneath the skin on the neck and lower face.

pledget.—A wad of lint, cotton, or the like, applied, as to a wound or a sore, to keep out the air, absorb discharges, or retain a dressing.

plethora.—Abnormal fulness; repletion; especially, superabundance of blood in the whole system (**general plethora**) or in an organ or part (**local plethora**); The latter may be *cerebral*, *pulmonary*, *uterine*, etc., according to its location.

plethoric.—Affected with plethora; having a full habit of body.

pleura.—The serous membrane that in folds the lungs and is reflected upon the walls of the thorax and upon the diaphragm.

plexus.—An interlacement of cord-like structures, as vessels or nerves.

polypus.—A pedunculate tumor arising from a mucous membrane and projecting into a natural cavity, as the nose or the womb.

pons.—A connecting part; specifically, the pons Varolii, the protuberance containing the commissural fibers that at the base of the brain connect the two hemispheres of the cerebellum, and bridging over the structures extending upward from the medulla oblongata: named after Costanzo Varolio (Varolius), an anatomist of Bologna (1544-'75).

porta.—The part of an organ where its vessels and ducts enter; especially, the transverse fissure of the liver.

portal.—(1) Of, pertaining to, or entering at a porta. (2) Of, pertaining to, or arranged like the portal vein.—**portal circulation**, the capillary transmission of venous blood from one organ of the body to another in its passage to the heart.—**p. system**. (1) The venous plexus by which blood is taken up from the abdominal viscera into the portal vein and carried through the portal capillaries of the liver. (2) Any system by which blood is removed by trunks that afterward break up into capillaries; as, the *portal system* of the kidney.—**p. vein**, the large vessel that conveys blood from the intestines and other abdominal viscera to the liver, there breaking up into a system of capillaries.

post-mortem.—Expert examination of the organs of a human body after death, for pathological or judicial purposes; an autopsy; necropsy.

pregnancy.—The state of being with child; specifically, the state of a woman who bears within her a fecundated ovum, or an embryo or fetus.—**abdominal pregnancy,** pregnancy where the impregnated ovum has passed into the peritoneal cavity.—**bigeminal p.,** gestation of twins.—**false p.,** a condition resembling pregnancy, but due to the presence in the womb of some abnormal matter or growth (as a mole or an encysted tumor) instead of a true fetus, or to some other cause.—**ovarian p.,** gestation where the fetus is developed in the interior of the ovary.

premonition.—A previous warning or notice of something yet to occur; forewarning; presage; foreboding.

premonitory.—Giving or containing premonition.

probe.—A smooth, slender rod, generally of silver, with a bulbous end, used for exploring cavities, the course of penetrating wounds, etc.

prognosis.—A conclusion or prediction relating to the future course and final termination of any case of disease, or the act or art of making such prediction: called **general prognosis** when having reference to a class of diseases, and **particular prognosis** when to a particular case of disease.

prolapsus.—The falling down of an organ or a part from its normal position through an opening or into a cavity with which it is normally connected; as, **prolapsus** of the womb or of the rectum.

proliferation.—The act of reproducing, especially with rapidity, as cells in tissue formation.

prophylactic.—Operating to ward off, especially disease; preserving from what is hurtful; preventive.

prophylaxis.—Preservative or preventive treatment for disease.

proteid.—Any one of a class of highly complex compounds containing carbon, hydrogen, oxygen, nitrogen, and sulfur, found as viscous solids or in solution in nearly all the solids and liquids of animal and vegetable organisms.

Proteids are the most important animal and vegetable compounds, and none of the phenomena of life occur without their presence. They possess common chemical reactions and are united by close genetic relationship. They are divided into **animal proteids** and **vegetable proteids**, between which no essential difference appears, and further subdivided into (1) **albumins**, (2) **globulins**, (3) **albuminates** or **derived albumins**, (4) **proteoses**, (5) **peptones**, and (6) **coagulated proteids**.

protein.—A compound obtained from proteids, originally regarded as a proteid deprived of its sulfur, but now as an

artificial product resembling alkali-albumin.

protoplasm.—The viscid, contractile, semi-liquid, more or less granular substance that forms the principal portion of an animal or vegetable cell.

pruritus.—Itching.

psychic.—Of or pertaining to the mind or soul; mental.

ptyalism.—Abnormal flow of saliva; salivation.

puberty.—That period in life at which a person of either sex becomes functionally capable of generation. The age at which puberty is attained varies in different climates and among different races, also among those of the same race and country.

pubes.—(1) The part of the lower central hypogastric region that is covered with hair in the adult; the pubic region.

(2) The hair that appears on the body at puberty; specifically, the hair on the pubic region. (3) The bony arch formed by the junction of the two pubic bones.

pubic.—Of or pertaining to the pubes; as, the **pubic bones**; the **pubic region**.

puerperal.—Pertaining to, connected with, or resulting from childbirth; as, **puerperal convulsions** or **mania**.

pulmonary.—Of, pertaining to, or affecting the lungs; as, **pulmonary veins**; **pulmonary tuberculosis**.

pulse.—The rhythmic beating of the arteries due to the passage of the blood-waves caused by the successive contractions of the heart; especially, such beating as is felt in the wrist by pressing the fingers on the radial artery. In an adult person the normal pulse varies from 70 to 75 beats per minute. It also varies with age, sex, and special conditions of disease, muscular effort, or mental emotion, and by its indications furnishes the physician with a ready means of diagnosis.—**p.-rate,** the ratio of arterial pulsations in a given length of time; as, a **pulse-rate** of 90 a minute.

pungent.—Having power to affect the nerves of sensation, as by pricking, stinging, or piercing. Specifically: (1) Affecting the sense of taste; acrid; biting; as, **pungent acids**. (2) Affecting the sense of smell; titillating; stimulating; as, **pungent snuff**.

purgative.—A medicine that, when taken internally, causes intestinal evacuations; a cathartic; purge.

purulence.—(1) The condition of being purulent; suppuration. (2) Morbid matter in an abscess; pus.

purulent.—(1) Consisting of pus; as, **purulent matter**. (2) Accompanied by the formation of pus; as, a **purulent ulcer**.

pus.—A secretion from inflamed tissues, especially the connective tissue, usually viscid or creamy, and consisting of modified leucocytes and other cells in a liquid plasma: the result of suppuration.

pustular.—Proceeding from or marked by pustules; as, a *pustular* eruption.

pustule.—A small circumscribed elevation of the cuticle with an inflamed base containing pus.

putrefaction.—(1) The act or process of putrefying; decomposition of animal or vegetable matter, accompanied by fetid odors: now regarded as a kind of fermentation, or breaking up of a complex organic compound into simpler compounds, produced by micro-organisms called **putrefactive ferments**. (2) The state of being putrefied.

putrid.—Bearing signs of or produced by putrefaction; as, a *putrid* smell.

pylorus.—The opening between the stomach and the small intestine; also, the adjoining portion of the stomach.

Q

quarantine.—(1) The interdiction for a fixed period of time (originally forty days) of all communication with persons, ships, or goods arriving from ports or places infected with contagious disease, or having or being supposed to have infectious disease on board. (2) A place designated and equipped for the enforcement of such interdiction; as, a vessel held at *quarantine*. (3) The enforced isolation of any person or place infected with contagious disease.

R

radius.—That one of the two long bones of the forearm which is on the same side as the thumb.

reaction.—(1) Contrary action or reversed effects following the first effects of an action, as the increase of bodily temperature on recovery from a chill, or depression following overstimulation. (2) A special vital movement tending to prevent or overcome some noxious action or influence affecting the bodily organism; recovery from a nervous shock. (3) An effect produced by application of stimulus to a nerve or muscle.

rectoscope.—A speculum for examination of the rectum.

rectum.—The terminal portion of the alimentary canal, extending in man from the sigmoid flexure to the anus.

reduction.—An operation for restoring fractures or displaced parts to their normal position; as, *reduction* of a hernia.

reflex action, motion, or movement.—An action produced by the transmission of an afferent impulse to a nerve-center and its reflection thence as an efferent impulse independently of volition: seen most commonly in the involuntary and instantaneous motion of winking when the eyes are threatened or recovering one's balance when slipping, also exhibited in continuous alternation of steps in walking, and including all acquired habits so far as they become automatic.

refraction.—The change of direction of a ray, as of light or heat, in oblique passage from one medium to another of different density, or in traversing a medium whose density is not uniform.

refrigerant.—Any medicine or material that reduces abnormal heat of the body.

regimen.—A systematized order or course of living with reference to food, clothing, and personal habits, followed for the sake of health or for accomplishing some physical effect.

regurgitation.—(1) A rushing into the mouth from the throat or stomach; especially, the vomiting of curdled milk by nursing infants. (2) Rush of blood backward into the heart, due to defect of the valves.

remedial.—Of the nature of or adapted to be used as a remedy; as, *remedial* measures.

remission.—Temporary diminution of a disease; as, *remission* of a fever.

remittent.—Having remissions, or only partial, irregular, or temporary diminutions, of energy or action; as, a *remittent* fever.

renal.—Of, pertaining to, affecting, or situated near a kidney; as, a *renal* artery.

resolvent.—That which has the property of reducing or dispersing a swelling.

respiration.—(1) The process of inhaling air into the lungs and expelling it; breathing. (2) Those processes, collectively, by which the system is oxygenated and carbon dioxide thrown off: divided, in the higher animals, into (a) *respiration proper* or *external respiration*, the interchange of gases that takes place in the lungs, and (b) *internal respiration*, the similar interchange between the cells and the surrounding fluids. (3) The sound heard in auscultation, indicative of breathing; the respiratory murmur.

respirator.—A device, as a screen of fine wire or gauze, worn over the mouth or nose: used by persons having weak lungs, or the asthmatic, to moderate or sift the air, or by workmen who are obliged to breathe air containing dust or smoke.

respiratory.—Of, pertaining to, employed in, or caused by respiration; as, *respiratory* organs.

restorative.—(1) Something to restore consciousness after a fainting-fit, as an irritant or a stimulant. (2) A medicine employed to restore health or physical vigor, as a tonic.

retina.—The inner coat of the eye, containing the nervous apparatus essential to vision. The retina consists of layers of nerve-fibers and nerve-cells, connective tissue, and peripheral end-organs. The fibers of the optic nerve lie internally next the vitreous humor, the rod-and-cone or bacillary layer externally on the choroid. In the inner portion, and strictly in the axis of vision, is the yellow spot (fovea

centralis or macula lutea), the region of most acute vision.

rheum, or rheuma.—(1) Catarrhal discharge from the nose and eyes. (2) Any thin watery flux from the mucous membrane of the head, as tears or saliva.

rigidity.—The character or state of being rigid or stiff; inflexibility.

rigor.—A violent chill either from cold or nervous shock; a shivering; ague-shake.—**rigor mortis**, the muscular rigidity that usually for a time follows death.

rubefacient.—A remedy causing redness or irritation of the skin.

rupture.—Same as *hernia*.

S

saccharin.—A white crystalline compound derived from toluene, a constituent of coal-tar. It is 300 times sweeter than cane-sugar, and finds use as a sweetening agent, especially for persons who can not eat sugar, owing to disease, as diabetes.

sacral.—Of, pertaining to, or situated near the sacrum; as, the *sacral* canal, nerves, or foramina.

sacrum.—A composite bone formed by the union of the vertebrae between the lumbar and caudal regions, constituting the dorsal part of the pelvis. In man the sacrum is triangular and consists of 5 vertebrae.

sagittal.—Pertaining to or resembling an arrow; straight; as, the *sagittal* suture, between the two parietal bones of the skull.

saliva.—An inodorous, tasteless, slightly viscid fluid, the specific secretion of the salivary glands; spittle. Saliva has been considered as a purely neutral substance, possessing neither alkaline nor acidulous element; but recent analyses indicate the presence of a minute proportion of alkaline constituents, potassium and sodium. Conveyed from the secreting glands through the salivary ducts into the mouth the saliva mingles with the mucous secretions, moistens the mouth and fauces, assists in deglutition, and is carried with the food into the stomach. It contains a specific element called *ptyalin*, which is considered a promoter of digestion.

salivary.—Of, pertaining to, secreting, or conveying saliva; as, *salivary* glands; a *salivary* duct.

salivation.—An abnormally increased secretion and flow of saliva, especially when due to the effect of drugs, as mercury ptyalism.

sanatorium.—(1) A locality conducive to the restoration or preservation of health, especially when used as a resort for invalids; a health retreat. (2) An institution for treatment of disease or care of invalids; especially, an establishment employing natural therapeutic agents or conditions peculiar to the locality, or

some specific treatment, or treating particular diseases.

sanies.—A serous greenish fluid of offensive smell, presenting the appearance of pus tinged with blood, discharged from ulcers.—**gangrenous sanies**, sanies resulting from death of tissue.

sanitarium.—A sanatorium; sometimes restricted to a place where the hygienic conditions are prophylactic or preservative of health, as distinguished from one where therapeutic agencies are employed.

sanitation.—The devising and applying of measures for preserving and promoting public health; the removal or neutralization of elements injurious to health; the practical application of sanitary science.

scapula.—The shoulder-blade.

scarp-skin.—The epidermis or outer layer of the skin; the cuticle.

sciatic.—(1) Of, pertaining to, or situated in the region of the hip; ischiatic. (2) Affecting the hip or its nerves, etc.; pertaining to, of the nature of, or affected with sciatica.—**s. nerve**, a large nervous trunk arising from the sacral plexus and passing down the back of the thigh.

sclerosis.—The morbid thickening of a tissue, accompanied by hardening; as, *sclerosis* of the skin.

sclerotic.—(1) Dense; hard; indurated: applied especially to the outer coat of the eye; also, of or pertaining to this coat of the eye. See *sclerotica*. (2) Pertaining to or affected with sclerosis.

sclerotica.—The dense white membrane which with the cornea in front forms the outer coating of the eye around the iris; the white of the eye.

sebaceous.—Pertaining to or appearing like fat; consisting of, containing, carrying, or secreting fatty matter; fatty; oily; as, a *sebaceous* substance; *sebaceous* glands.

secretion.—(1) The process by which materials are separated from blood or sap, and elaborated into new substances; as, the *secretion* of milk, gastric juice, or urine. Secretion in animals is generally performed by glandular epithelial cells. (2) The substance secreted: either serving some purpose in the animal economy, as saliva, gastric juice, or milk, or to be thrown off as useless or injurious (excretions), as urine.

secretory.—Of, pertaining to, or concerned in secretion; secreting; as, *secretory* glands.

sedative.—A medicine efficacious in allaying pain, calming nervous excitation, etc., acting by lessening functional activity and depressing vital force.

semen.—The fluid produced by the generative organs of a male animal by which impregnation is effected, usually a whitish viscid fluid containing innumerable spermatozoa secreted by the testes; the impregnating fluid of male animals; seed; sperm.

seminal.—Of or pertaining to the reproductive elements of animals or plants, especially to semen; consisting of, containing, producing, or conveying semen; contained in semen; as, the *seminal fluid*; *seminal duct*; *seminal granules*.

senile.—Pertaining to, characteristic of, or affected by old age; especially, peculiar to or proceeding from the weakness or infirmity of old age; as, *senile acts*; a *senile mind*.

sensory.—Of, pertaining to, or characterized by sensation; conveying or producing sensation; as, a *sensory nerve*.

sentient.—Having the power of originating or occasioning sensation; as, the nerve of a tooth is *sentient*.

septic.—Of or pertaining to sepsis; productive of putrefaction; putrid.—**septic fever**, putrid fever; a fever due to the action of septic poison.—**s. poisoning**, poisoning from absorption of the products of putrefaction.

septum.—A dividing wall; partition; as, the *septum* of the nose.

sequela.—A morbid condition occurring as a result of a preceding disease.

sequestrum.—A piece of dead bone remaining in its place, though separated from the living bone.

serous.—Of, pertaining to, producing, or resembling serum; as, a *serous fluid*.

serum.—(1) A clear, aqueous, light-yellow liquid that separates from the coagulum of the blood. (2) Any similar secretion containing albumin; as, muscle-*serum*.

sinus.—(1) A hollow or cavity, as of a bone, especially when of considerable size; a recess; also, a dilated part, as of a vessel; an ampulla. (2) Any long, narrow opening leading to an abscess or to a diseased structure.

slough.—Dead tissue separated and thrown off from the living parts; as in gangrene; also, a scab.

solvent.—(1) A fluid, as water or alcohol, capable of dissolving substances; menstruum. (2) A medicine used for dissolving morbid concretions or obstructions in or upon some organ; as, a *solvent* of urinary calculus.

somnambulism.—The act of walking and performing other actions during sleep; also, the psychological affection that induces such activity; a condition of the brain that prompts the patient while sleeping to perform unconsciously acts that naturally belong to the waking state.

somnambulist.—One prone to walk and perform other actions in his sleep.

soporific.—A medicine that produces deep sleep, as distinguished from an anodyne.

spa.—Any locality frequented on account of its mineral springs; also, a mineral spring.

speculum.—An instrument for dilating canals and cavities of the human body and facilitating an examination of their interior.

spermatic.—Of, pertaining to, conveying, or containing sperm or semen; secreting spermatozoa.—**spermatic cord**, the cord, made up of the spermatic duct and its accompanying vessels and nerves, that passes from the testis through the inguinal canal into the abdominal cavity.—**s. duct**, the duct by which semen is conveyed from the testis; the vas deferens.

spermatozoon.—One of the living elements in the semen, to which it owes its fecundating power; the essential male fertilizing element.

sphincter.—A muscle that surrounds an opening or tube and serves to close it.

spinal.—Of, pertaining to, or connected with the spine or back-bone; vertebral.

sporadic.—Occurring here and there, or at irregular intervals; separate; single; specifically, neither epidemic nor endemic; isolated: said of diseases.

squamous.—Scale-like.

stapes.—The innermost ossicle of the middle ear. It is stirrup-shaped in man and most mammals.

sternoclavicular.—Of or pertaining to both the sternum and the clavicle.

sternum.—The breast-bone.

stertorous.—Characterized by deep snoring; as, *stertorous* breathing.

stethoscope.—An apparatus for auscultation, consisting essentially of a tubular or solid piece of wood or hard rubber to be applied to the patient's body, sometimes with a tube or tubes for conveying the sound to the physician's ear or ears.

stimulant.—Any agent efficacious in exciting organic action in the human system, whether acting on the nerves or directly on the tissue.

stupor.—A condition of the body in which the senses and faculties are suspended or greatly dulled; induced weakness or loss of sensibility; profound lethargy; torpor.

sty.—A small inflamed swelling on the edge of the eyelid.

styptic.—A substance or agent that, applied locally, arrests bleeding, acting chemically or mechanically.

subcutaneous.—Situating, found, or existing beneath the skin; used or applied beneath the skin; hypodermic.

submaxillary.—Situating beneath the maxilla or lower jaw.

sudorific.—A medicine that produces or promotes sweating.

superior.—Situating relatively nearer the top of the head when the body is standing erect.

suppuration.—(1) The act or process of forming or generating pus. (2) Pus.

suppurative.—Tending to, producing, or produced or characterized by suppuration; as, a *suppurative* wound; *suppurative* inflammation.

symptom.—A functional or vital phenomenon of disease; any perceptible change in any organ or function due to morbid conditions or to morbid influence,

especially when regarded as an aid in diagnosis.

synovia.—The albuminous fluid secreted by the synovial membranes in the interior of joints and in other places where lubrication of apposed surfaces is necessary.

synovial.—Of, pertaining to, or producing synovia; as, *synovial* glands.

systemic.—Pertaining to the human system; pertaining to the body as a whole.

T

tarsus.—The ankle.

tartar.—A yellowish crust that forms on the teeth, consisting chiefly of calcium phosphate.

tendinous.—Of, pertaining to, resembling, or formed by a tendon.

tenesmus.—Frequent desires with painful and unavailing efforts to evacuate the bladder or bowels; spasmodic contraction of the sphincter muscles of the bladder or rectum, due to inflammation of the mucous membrane.

tensor.—A muscle that stretches or tightens a membrane or part.

therapeutic.—Having healing qualities; curative; alleviative.

therapeutics.—The department of medical science that relates to the treatment of disease.

thorax.—The part of the body between the neck and the abdomen, enclosed by the ribs, sternum, and thoracic vertebræ, and containing the heart and lungs. In mammals the thorax is completely separated from the abdominal cavity by a muscular partition, the diaphragm.

tibia.—The inner one of the two bones that constitute the skeleton of the leg below the knee; the shin-bone. In man it is the larger of the two.

tic-douloureux.—Neuralgia of the fifth nerve, usually associated with muscular twitchings.

tissue.—One of the elementary fabrics of which an organ is composed, formed by cells and their products arranged in a definite manner; the proper substance of an organ.

tonic.—A medicine or a regimen that gradually restores the normal tone of organs from a condition of debility.

tonsil.—One of two oval lymphoid organs situated on either side of the fauces, or passage from the mouth to the pharynx.

torpor.—Complete or partial insensibility; stupor; hence, apathy; torpidity; specifically, a sluggishness of action in an organ or of the whole body.

toxicology.—The branch of medical science that treats of the nature of poisons, of their morbid effects, of their detection in the organs or tissues, of their antidotes, and of the treatment of diseases due to poisoning.

trachea.—The windpipe.

tracheotomy.—The operation of making an opening by incision into the windpipe, in order to extract a foreign body or for the admission of air into the lungs.

transudation.—The act or process of transuding; specifically, the passage of a liquid through a tissue or membrane; especially, the passage of the fluid constituents of the blood through the coats of the blood-vessels or the capillaries; also, the fluid that transudes.

trauma.—Any injury to the body caused by violence; a wound; also, the violence that causes it.

traumatic.—Of or pertaining to trauma as, *traumatic* remedies; *traumatic* tetanus.

tremor.—An involuntary and continued quivering or shaking of the whole or some part of the body: a form of paralysis.

triceps.—A muscle having three heads; especially, a large muscle of the back of the arm.

tricuspid.—Having three cusps or points, as a molar tooth or a valve of the heart.

trochanter.—One of several bony processes found upon the upper part of the thigh-bone. There are usually two, as in man, distinguished as the *greater* (for the gluteal muscles and rotators) and the *lesser* (for the psoas and iliacus).

tubercle.—A small, granular non-vascular tumor or nodule, formed within the substance of an organ from new matter resulting from morbid action, regarded as due to a micro-organism, the tubercle-bacillus (*Bacillus tuberculosis*) and with tendency to purulent or cheesy degeneration and destruction of structure.

tumefaction.—Any abnormal rising up of a part, as in a tumor; a swelling; puffiness.

tympanum.—(1) The middle ear; the cavity between the tympanic membrane and the cochlea, with which the Eustachian tube connects. (2) The tympanic membrane; the ear-drum.

U

ulcer.—An open sore on an external or internal surface of the body; a solution of continuity in the soft parts with loss of substance, generally accompanied with formation of granulations and secretion of pus.

ulna.—That one of the two long bones of the forearm that is on the same side as the little finger.

umbilical.—Of, pertaining to, or situated near the umbilicus or navel.

umbilicus.—The navel.

unilateral.—One-sided.

urea.—A very soluble, colorless, crystalline compound contained abundantly in urine.

ureter.—The duct by which the urine passes from the kidney to the bladder.

urethra.—The duct by which urine is discharged from the bladder.

urinary.—Of, pertaining to, or concerned in the production of urine.

uriniferous.—Concerned in the conveyance of urine.

urogenital.—Relating or pertaining to the urinary and genital system as combined.

uterine.—Of or pertaining to the uterus.

uterus.—The womb.

uvula.—The pendent fleshy portion of the soft palate.

V

vaccine.—The virus of cowpox, as prepared for or introduced by vaccination: usually lymph, dried or fluid, or part of the crust from a pustule.

vas.—A vessel or duct.—**vas deferens,** the passage by which semen is conveyed from the epididymis to the seminal vesicles.

vascular.—(1) Of, pertaining to, consisting of, or containing vessels or ducts for the conveyance of fluids, as blood, lymph, chyle, or sap; serving for the conveyance of fluids; circulatory; as, the *vascular* system; *vascular* functions of animals or plants. (2) Having vessels; specifically, richly supplied with blood-vessels; as, *vascular* tissue.

vein.—One of the muscular tubular vessels that convey blood to the heart: distinguished from an *artery*.

venesection.—Bloodletting.

venous.—Of, pertaining to, or contained or carried in a vein or veins.—**venous blood,** the blood carried by the veins: distinguished from arterial blood by its darker color, and containing a relatively large amount of carbonic oxid and a small amount of oxygen.

ventricle.—One of the two chambers of the heart from which blood is forced into the arteries.

vermiform.—Having the form of a worm; long, thin, and flexible.

vermifuge.—Any remedy that expels or destroys intestinal worms.

vertebra.—One of the segmented portions of the spinal column.

vertigo.—(1) A feeling as if external objects whirled round the person affected, or as if himself had been whirled round, with a tendency to fall; swimming of the head; giddiness; dizziness. (2) Any movement or sense of movement, either in the individual himself or in external objects, that involves a real or seeming defect in the equilibrium of the body and is associated with more or less disturbance of consciousness: a common symptom of excessive or defective supply of blood to

the brain, and also of derangement of the digestive organs.

vesical.—Of, pertaining to, or supplying the bladder; as, *vesical* arteries.

vesicant.—A blister-plaster; blister:

vesication.—The formation of blisters; action of a vesicant.

vesicle.—Any small bladder-like cavity, cell, or cyst. Specifically: (1) A small saccular cavity, usually containing fluid. (2) Any small rounded elevation of the cuticle containing a clear liquid.

vesicular.—Relating to, consisting of, or like vesicles or blisters.

viable.—Capable of maintaining life; having power to maintain existence: said specifically (1) of a fetus so formed and so far developed that if born it would be capable of living, and (2) of a newly born infant with regular and normal organization. As a general rule the fetus is not viable before the end of the seventh month.

virus.—A morbid poison; the morbid element or principle, whether a germ, the product of a germ, or of unknown character, that is the agent or medium for communicating infection or infectious disease; as, smallpox-*virus*, syphilitic *virus*, etc.

viscera.—Plural of *viscus*.

viscid.—Sticky or adhesive; semifluid.

viscus.—One of the organs of the great cavities of the body, as the stomach, lung, or brain.

visual.—Of or pertaining to the sense of sight.

vitreous.—Resembling glass in some property or properties; as, *vitreous* humor.

volatile.—Evaporating rapidly at ordinary temperatures on exposure to the air.

vulva.—An opening or entrance; specifically, the external opening of the female genital organs.

X

xanthoma.—A cutaneous disease characterized by a growth of yellowish tubercles, generally in flat patches, occurring commonly on the eyelids, due to formation of new pigmented connective tissue.

Z

zygoma.—The long arch that joins the temporal and malar bones on the side of the skull.—**zygomatic arch.**—The zygoma.—**z. fossa,** the hollow in the skull behind the superior maxillary bone and below the zygoma.

zygomatous.—One of two small muscles of the face that arise from the malar bone and are inserted about the mouth.

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